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Computer Weekly

Thursday, September 22, 1983

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HP gets into the personal fray

by Philip Hunter
HEWLETT-PACKARD this week launched a 16-bit IBM compatible micro and a worldwide marketing campaign to attack the business personal computer market.

The move strengthens the company's armoury in the battle for small business system users, following the launch in July of three minis to replace the HP 3000 Series.

The new HP150 has a touch sensitive screen, and offers the MS-DOS operating system, but not the popular CP/M system. UK retail price will be £2,900 for a version with dual 3½-in Sony floppy disc drives, and £4,650 for a 15 Mbyte hard disc version, making it comparable with other popular models, notably the IBM PC and the Sirius.

John Golding, head of European marketing of personal computers, claims that the pricing of the new machine ends the company's reputation for offering quality only at great expense.

"We are aiming for 10% to 15% of the business PC market," says Golding. This market will be worth about \$10 billion in 1984, according to some estimates.

The company will start a big promotional push at UK dealers, software houses and users in 1984, and has already embarked on a \$7



GOLDING... "We are aiming at 10-15% of the market."

million television advertising campaign in the US.

Next month, the company will open a new customer support centre in Reading, offering a free phone-in consultancy to all users of the HP150. Software for the green phosphor screen will have to be specially adapted, and the company will issue instructions to third party software houses which, contrary to previous company practice, will be actively encouraged to provide packages for the new machine.

The company has its own high level operating system called Personal Application Manager to shield the user from the complexities of MS-DOS. "It is possible for the user not to realise that MS-DOS is the operating system," Golding claims.

The HP150 has a 9in screen, but Golding claims that the sharp definition of the display will compensate for its size.

European versions of the HP150 will be built at Grenoble in France, and Golding says that each country will have its own version of the machine.

GEC converges on commercial market

by John Kavanagh
GEC is setting its sights on the commercial computing market in a big way for the first time.

The UK industrial giant's move follows the signing of a deal with US microcomputer manufacturer Convergent Technologies and a decision to standardise on the Unix operating system following tests.

But the move is still 18 months off and will depend partly on the company's success with the Convergent Technologies 16-bit machine.

The US microcomputer fills a gap at the bottom of GEC's 4000 minicomputer range. It runs Unix and GEC is now completing live tests of Unix on the 4000 at some customer sites.

"Our existing scientific and engineering users are asking for equipment such as the Convergent Technologies machine, because they want to move timesharing applications to standalone micros," explained Chris Ellis, the marketing director of GEC Information Systems.

"First we will satisfy the needs of these, our traditional, customers."

"Some will add the micros to their GEC networks."

"But our ambitions don't stop there. We're not really big in commercial computing - but that will change."

"We'll start by aiming at programmers, who will be attracted

by the Convergent Technologies machine.

"After 18 months of this the potential of the commercial market will be much clearer," declared Ellis.

And he added: "I think the potential will be such that the only constraint will be the rate at which Convergent Technologies can supply the machine."

Ellis said GEC was examining Unix application packages. There would be compatibility from the Convergent Technologies machine up to the range of 32-bit GEC computers.

GEC Information Systems will sell the microcomputer directly to users through its own sales force and through its office automation subsidiary A.B. Dick.

The new 16-bit machine will be sold in the UK, Europe and the US.

Links to GEC's SL-1 digital private telephone exchange and to the teletex super telex service will be provided.

If GEC's plans come to fruition this will be the company's first positive push into the commercial market.

In the past the company has concentrated on scientific and engineering users.

Two months ago it was on the verge of moving into the business microcomputer market with a £3.25 million takeover of UK firm Torch but that deal fell through a month later.

BT rejects IBM billing and gives ICL a chance

by John Kavanagh
BRITISH Telecom has rejected a US package, based on IBM hardware, which could have been a quick answer to its need for a new customer billing system.

The corporation has gone back to the drawing board to develop its own system, giving ICL a chance to win a plum contract, which could involve orders from the 61 telephone areas.

BT had been evaluating the system from US telephone firm Cincinnati-Bell since March. "We felt that taking an established system would be a quick way to get going," BT said. "But the US company's working practices and the way it is managed are very different from ours and we would have to put a lot of time and effort into adapting it."

"Given the technology that is available we can develop our own system fairly quickly. A tailor-made system is bound to be better."

BT wants a new billing system partly because the 61 areas are being given more autonomy and becoming profit centres, so its central billing system is no longer appropriate. In addition it is a hatch system and more than 15 years old. It produces bills but little in the way of management reports. It runs on ICL mainframes.

BT also wants a modern system because of the possibility of competition as its monopoly is watered down.

The new billing system will give customers the option of having details of every call printed on the bill. It will also hold details of customer's communications, with fault histories, changes and so on. The Cincinnati-Bell package would have had this second part of the system.

BT said it was now at the system development stage but had not decided which option to use. ICL was a possible contender but it was not clear if it was probably ICL's biggest system from IBM, GEC or

any, before choosing the system that will handle the bulk of calls for the billing system.

The billing project has been tackled from various quarters. The National Civil Liberties has pointed out the possibility of government monitoring calls.

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Osborne may go on in the UK

by Howard Karten
OSBORNE Computer Corporation, which filed for bankruptcy under Chapter 11 of US law last week, has up to eight weeks in which to raise enough cash to carry on.

There is virtually no chance it will take back the 1,000 manufacturing staff who have been laid off. But the company could re-emerge as an exporter of kits from the US for assembly in other parts of the world. At present all manufacturing at the Hayward, California, plant has ceased and only 70 employees are retained.

But UK managing director Mike Healy was optimistic that the British side of the business would continue, whatever the outcome of the attempt to resume the American operation from collapse.

He said he had been approached by a number of sources wishing to put money into the UK distribution, to sell both existing and new computer products.

Last Friday, the Californian bankruptcy court allowed Osborne protection from its creditors in the short term, by letting the banks give it credit.

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Edwardes quits Mercury in favour of ICL

by Andrew Thomas
SIR Michael Edwardes is to replace retiring ICL chairman Sir Christopher Laidlaw. Edwardes is currently non-executive chairman of Mercury Communications and is to quit the post when his contract expires at the end of the year.

BP man Laidlaw has decided to retire after three years in office and will leave ICL next April. Edwardes joined the ICL board as a non-executive director last Saturday and is scheduled to become deputy chairman on January 1, taking over from Laidlaw on April 2. His contract is for three years and is renewable.

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EDWARDES... "Likely to be more adventurous."

Rodime wins big US contract

by Caroline Burgess
PUBLICLY-BACKED Rodime has won a \$7 million contract to supply Winchester discs to US micro maker North Star.

The Scottish based company is to supply 5¼ inch discs to North Star's factories on both sides of the Atlantic - in California and in Cork - over the next 15 months.

Rodime now gets 60% of its orders from the US. Its California sales office was set up at the beginning of last year.

The company is building a

manufacturing plant in Florida which should start production by the end of next year.

Malcolm Dudson, Rodime's managing director, described the deal as significant, saying: "As a growing number of US micro manufacturers come to set up European production facilities, Rodime's capacity to service them on both sides of the Atlantic will become increasingly important."

The high capacity RO 206 and RO 208 drives to be supplied are all to be manufactured in Scotland.

HP looks at the UK for research site

HEWLETT-PACKARD is looking at the UK as a new site for some of its 1,000 strong research team. The company's research director, John Doyle, met IT Minister Kenneth Baker and Industry Secretary Cecil Parkinson to discuss a UK site as part of possible plans to move its research centre from Palo Alto to Europe or Japan. Doyle said that there was still competition for staff at its current location in Silicon Valley.

CAP turnover

TURNOVER of UK systems house CAP rose 43% to £20 million in the year to April 30, 1983, leaving a pre-tax profit of £965,000. Overseas earnings accounted for 15% of the total revenue. Last year it recruited 101 graduates, taking its total staff numbers of 941.

Piracy meeting

A DOZEN UK software and computer firms are meeting tomorrow to discuss a one-year programme aimed at designing a standard solution to software piracy. The meeting is being led by the Government's British Technology Group and the National Physical Laboratory. Participation by overseas firms is not ruled out. See page 6.

Circulation rises

COMPUTER WEEKLY has boosted its circulation to 120,000 copies, making it the highest circulation weekly computer journal in the UK. The move is part of continuing developments at Computer Weekly, which recognises the increased size of the industry it is serving. Last week, for example, saw the introduction of Management Review, a monthly supplement to Computer Weekly.

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MSC doubles its training hand-out

by Philip Hunter
THE Manpower Services Commission (MSC) has more than doubled its cash support for firms in the computing services industry so they can train their staff.

The total grant aid available in the next 12 months is £100,000, but there is now a limit of £750 per trainee, and no one firm can have more than 30 grants.

"We have managed to get training based on what people need," says Gordon Ewan, head of Cash, the Computing Services Industry Training Council, which will distribute the grants. Ewan welcomes the increased total cash available, but says he originally wanted £1,000 not £750 for each trainee.

Companies will now have to conform more closely to training guidelines laid down by Cosit and

the MSC, and will for the first time have to be members of Cosit. "You've got to show willing and join the club," comments Ewan.

Ewan says that several loopholes in the old grant scheme have been closed. Last year there was a concept called additionality, which meant that in some cases cash was only available to companies training more people than in the previous year. This discriminated against firms hard hit by the recession, says Ewan.

Another loophole was that some training firms claimed last year that their clients could make a profit from training with the MSC grants. "We will make damn sure that it doesn't happen again," says Ewan. With a single block grant this time, Cosit will find it easier to make sure that the training is really worth the money.

Ewan says he would like to see the MSC continuing to expand its support for training in real terms during the rest of the five-year programme, pointing out that £800,000 is still a tiny proportion of the MSC's annual £1,500 million budget.

The MSC hints that more money might be available next year. Rob Napier of the MSC's training group says: "We're saying to Cosit that we're sufficiently impressed by what you've produced so far to go ahead. But we reserve the right to pull out."

Napier says that the MSC's other programmes of support for the computer industry will be virtually unchanged in 1984. One such programme is for firms to seed staff on courses in implementation of small business systems, limited to five grants per company.



EWAN... "Got to show willing and join the club."

Shortfall in IBM software and support, says report

by Keith Holder
IBM NETWORK products are something of a curate's egg according to users' comments expressed in a Nephon report, *Networking in Practice*. The overall message is that while the hardware is robust and reliable the software and support leaves something to be desired.

A real expertise shortage is ascribed to IBM's support function, a view shared by John Barker, computer services manager for Aylesford Systems & Computer Equipment, who commented: "The biggest problem with support is when you try to upgrade your software. IBM changes what

it is offering so quickly that even its own engineers don't realise it." But, he added: "Its effort is usually very good." He went on to say that once installed and running the software he has used has proved reasonably reliable.

Part of the report looks at what users would like to see IBM do with these products in the future. Top of this list is the integration of VM into the mainstream networking products and improvements in network management tools.

Other topics included staffing levels, problem areas and user evaluations of individual products though no specific recommendations about what to do are given.

High street battle heats up

by Keith Holder
THE high street battle to sell software to the home computer user has been joined by National Magazine and HMV. Both companies have announced plans and products, aimed at Britain's one million users, offering games and educational packages.

National Magazine is launching Ebury Software this month at the Personal Computer World Show where it will demonstrate six early learning packages.

These are aimed at the three to six year old and will run on most popular makes including the BBC Micro B, Sinclair Spectrum, Dragon and Commodore 64. The

cost for each cassette is £12.95. They will be available through specialist computer stores, high street department stores and direct from the publishers. Each package has been produced in conjunction with a team of educational experts and programmers.

The company is keeping quiet about future releases, though Roger Barrett, publishing director of Ebury, said: "Some of these will be linked to topics covered in our major publications."

He sees a good market for this type of product, adding: "There are more microcomputers, per capita, in this country than anywhere else in the world and we believe

that there is considerable demand for quality software programs."

HMV is opening software departments next week in its main shops in London, Glasgow and Hull. These will be staffed by expert advisers hired by the company to help the public by answering questions about home computing, and advising on computer games.

Software for Spectrum, ZX 81, Vic 20, Oric, BBC, Atari and Dragon systems will be held in store. A spokesman for the company said that this initial launch was designed to "test the water" and if it proved successful then similar departments would open in the company's other outlets.

SALES BRIEF

Barclays orders 600 more minis

DIGITAL Equipment has secured an order for 600 PDP-11 minis from Barclays, following an earlier order for 150 PDP-11s. All the minis will be installed in the bank's branch system offering electronic mail.

The minis will run the bank's software developed by the bank to link branch networks with the private Barclays communications network.

Bank buys Arbat

ARBAT, the UK specialist in banking systems, has bought £170,000 export order, valued at £150,000, from Credit Lyonnais, the largest bank, Crédit Lyonnais, which will be bought with an Arbat computer-based terminal (CBT) to link up with its public telex network.

Aim hits peak

IBM-based OEM and service company Aim has hit a peak sales of Digital Equipment Corporation's VAX minis this month. Major buyers include wholesale ironmonger Rye & Co, which is replacing a DEC mini system with a DEC mini system run stock control.

NCC order

THE National Computing Centre has ordered £100,000 worth of Series 86 workstations from Link Machine Technology of London. The machines will be installed at the centre's microsystem centres, to provide a directory for micro users.

Oilfield order

THE Middle East computer user has ordered £1 million worth of Cullinet Systems. The latest contract is for the replacement of a third Argus computer system for installation at an Abu Dhabi oil production equipment.

CTL in the City

COMPUTER Technology Ltd, which heads the UK challenge to Tandem in the market for financial hardware and software, continues to push its financial sector. Its latest move is from City investment management company John Gorton & Co. to provide word processing and communications software in conjunction with CTL equipment.

Getting into print

LAURA Computer Systems has sold the first of a new range of small business printers. The printer is designed for the printing industry to use. It is a desktop printer, which is easy to use and has a low cost of ownership. It is a good choice for small businesses and publishers.

Veteran replaced

NIXDORF, West German second largest indigenous computer maker, has sold one of its Model 10 computers to the UK. The machine will replace a year-old computer for control and invoicing.

Bedroom check

OPTIM-MCS, the first London-based small systems company, has installed a hotel management system for the Royal Hotel in London. The system is a good example of the use of the telephone in each bedroom.

Bureaux lose to insiders

by John Kavaagah
COMPUTING services firms are more than holding their own in the recession, with surviving companies growing at an average of 20% a year - and predicting a rosy future.

But the bureau business is under heavy threat and falling rapidly as a percentage of the total market as more and more companies move to in-house computing.

This emerges from the Computing Services Association's (CSA) annual report, which shows that 15% of its 192 members grew 50% last year. Another 40% grew by over one fifth. Total revenues were about £815 million and the members employed over 29,550 people. But the recession claimed some victims, and if these companies' results are taken into account the

overall growth rate was about 15%.

The healthy state of services companies and their need for cash to fund growth make them prime targets for takeovers, the report indicates. Hardly any UK firms with between 100 and 200 staff have stayed independent. But the report notes that this could change because more firms are going for Stock Exchange listings to raise funds.

Bureau processing is still the biggest market segment, but last year it fell from 34% to 30%. Only one-third of the members thought it would grow in 1983. Software services is the second biggest money spinner, with 17% of the market, while consultancy and turnkey systems services have about 14% each. Software pro-

Apple scraps Lisa software deal

by Howard Kartoo
APPLE Computer has cancelled an arrangement under which Cullinet was developing software to permit interfacing the Lisa with IBM mainframes. The move follows price cuts for the Lisa.

Introduced in January costing \$10,000, the Lisa was seen from the start as an impressive product. But industry observers had several questions about its viability, such as the lack of a software base, the lack of upward compatibility of previously-written Apple software, Lisa's high price, and the inroads into the business world already made by IBM.

Apple's price reductions - a Lisa will now cost \$6,995 with no software, \$8,190 with the six software packages originally introduced with it - are generally regarded in the US as at least tacit

admission that sales have been lagging. Apple is reported to have spent about \$50 million on development costs.

In addition, the original price tag is seen as having put off smaller firms which otherwise were attracted to the idea of microcomputers for their businesses.

Cancellation of the Cullinet pact will not help sales. Software for linking IBM Personal Computers to mainframes (chiefly those with IBM's Esclutheo) has been a hot area in America in recent months, with most major mainframe software vendors announcing such a package.

Lisa has lagged conspicuously behind in this area, and prospective buyers in larger corporations are said to have been disappointed.

Philips picks Unix for office

by Philip Hunter
PHILIPS' long-awaited attack on the office automation market, to be announced at next month's Telecom 83 exhibition in Geneva, will be based on the Unix operating system.

Unix has already penetrated many markets, but until now has not been favoured in office systems.

The decision to go for Unix meant looking for a micro that runs it, and Philips has plumped for US micro maker Plexus and placed a \$40 million order covering the next three years.

Philips says it chose Plexus from among 20 other supermicro makers because the micro runs the Unix System III operating system approved and supported by AT&T's Bell Laboratories, which first developed the system.

"Many other manufacturers of Unix-based systems employ 'lookalike' versions of Unix that do not provide the vendor independence of Unix," said Philips spokesman.

Unix System III is the most up-to-date version of the operating system and contains all the promised facilities such as source code management.

Philips says the Plexus supermicro were also favoured because they implement Unix efficiently, enabling up to 40 users to cram on to a single P/60 supermicro.

Philips had planned to launch its office automation system at Hannover Fair last spring. But the company had not been able to settle on the right micro to control the networks, and in the end had to go outside the company to Plexus.



THOMAS... "Growing government and City confidence."

ducts now accounts for 8% of the business.

Hardware accounts for a "surprisingly high" 15% of CSA members' revenues. Bureaux are boosting income by selling microcomputers and terminals, while software houses are getting more involved in providing complete systems.

Retiring president Peter

Thomas of Prael said there were firm signs of growing government and City confidence in the industry. The government had announced a further £15 million for the Software Products Scheme and the Manpower Services Commission had made more money available for training. There had been more City investment in services forms than ever before.

Hazeltine offshoot bid to raise takeover cash

by Nanda Moran
ESPRIT Systems of New York, which became independent of the Hazeltine Corporation in February, is offering 1,000,000 shares to the public on the New York exchange. They are being offered at between \$12 and \$15 each, so the sale could raise up to \$16.5 million.

Part of this will be spent on financing acquisitions in computer peripherals and small business computer systems that will be manufactured offshore and sold through the company's worldwide network of 75 dealers.

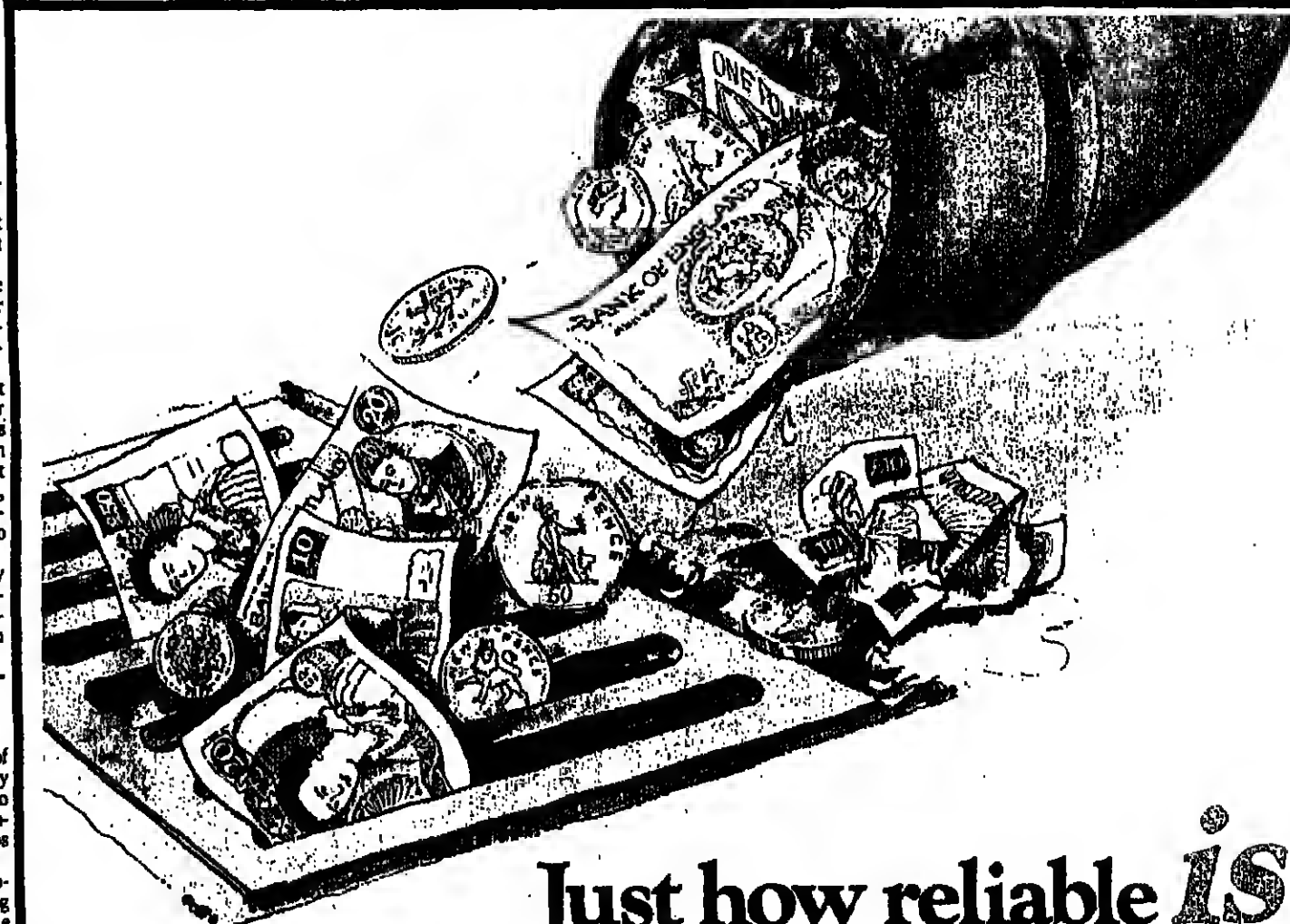
Although it is still a private company, Esprit is one of the five highest terminal manufacturers in the world. It achieved this status as a division of Hazeltine. But the high overheads that Esprit had as a division of Hazeltine meant it lost \$3.5 million in 1982-83.

Four employees of Hazeltine bought out the division for \$5 million. This gave them, with a fifth founder, the rights to the Esprit product line of seven VDUs and to use the Hazeltine name for up to two years. They also took on the 50 or so staff employed by the division.

Allan Maurer, Esprit vice-president of marketing, explained that the drive more went ahead because Hazeltine could not keep pace with the changing market for terminals. "The way the terminal market is going you don't need heavy investment in new products; what is needed is rapid design times and low cost manufacturing."

At the time of the takeover manufacturing was in New York. Maurer arranged for production to be moved offshore to Korea and Taiwan. Esprit also set up a company in Hong Kong. "All research and development work is done at our headquarters in New York," said Maurer, "but by transferring our manufacturing offshore costs have been cut right back. At the same time, as an independent company we don't face the same overheads we did as part of Hazeltine."

These adjustments in expenditure mean that Esprit can keep its prices down and appeal to the low cost, non-programmable market which is estimated as growing at 20% a year worldwide. Esprit sold about 24,000 terminals in the first six months of its independence. This compares with 34,000 which Hazeltine sold in 1982, an increase of about 40%.



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'Protect consumers from electronic payment'

by Donald Kennett
LEGISLATION may be necessary to protect consumers from error, fraud and other ill-effects from the use of electronic payment systems, according to the Office of Fair Trading (OFT).

Speaking at EPOS 83, the fourth European congress on automation in retailing, OFT consumer affairs director Clive Newtson said that the banks and the Videotex Industry Association had already provided some safeguards for consumers involved in electronic transactions

in shops, at cash dispensers and via Prestel.

But microelectronic systems made it easy for companies to break into the market for money transmission services and the new-comers would not be bound by any voluntary agreements between pioneers.

If manufacturers, retailers and banks paid attention only to their own needs, he said, consumers could suffer ill-effects that prompted them to obstruct development which would otherwise bring significant increases in efficiency.

No definite requirements for legislative change had been identified, he said, but the risks included fraudulent debits being made from private bank accounts, incorrect debits or credits occurring because of technical faults and privacy being eroded through account details reaching third parties.

Electronic funds transfer (EFT) systems might need to be governed by such measures as limits to customers' liability and extensions to the forthcoming privacy controls to cover credit reference agencies. Videotex-based services should be required to give confirmation of a customer's order as a matter of course and to archive the data collected from response frames.

Neither of these requirements was included in the VISA code of

practice, but in any case legislation might be necessary to make them apply to non-VISA service providers, to videotex networks other than Prestel and to interactive services based on cable television networks.

When direct broadcast satellites were introduced, he added, an international solution would be needed.

Professor Grigor McLelland, chairman of the distributive trades' Little Noddy (Economic Development Committee), said that over the next two or three years the distributive trades would become the biggest users of information technology after the government and financial services sectors.

There was a massive comprehension gap between the new technology and the smaller trader, he added, and to combat this the committee was running a conference aimed at small traders on October 27 in Solihull.

There was also a proposal to set up a national advisory centre for technology in the distributive trades that had been warmly welcomed up to ministerial level. The proposal had come from an EDC working party that had reported in May and the centre was now likely to be set up in Manchester in association with the Manchester Business School.

ep
OL83



NEWTON... "Consumer"

At last — more cash for the IT campaign

by John Kavanagh
THE government is putting up £250,000 to keep last year's information technology awareness campaign going for another 18 months.

But industry people close to the IT82 campaign say the amount is far too little, and they point out that it is coming nine months after the end of last year's programme. During those nine months the government has relied on the IT82 committees to carry on last year's work on a voluntary basis.

The money will pay the salaries and expenses of 10 regional co-ordinators. They will work closely with local Department of Trade and Industry offices and with the regional committees. The jobs will be full-time but last for only 18 months.

The government has also bought two more caravans to mount mobile exhibitions on information technology. One will show an automated office and the other will concentrate on computing in re-

tailings. These will join the six from last year and tour the country. They will be run by the National Computing Centre.

"The funding is not enough," said Alan Benjamin, director of IT82 and a full-time director of software house CAP. "A regional co-ordinator won't be able to do much with £25,000."

But, he added: "They will be important in keeping local events going. And their close contact with the Department of Trade and Industry will mean the department's aims will get through to the committees immediately."

The department said there had been a lot of goodwill from committee members. People had given up their time, and companies had provided exhibition space and meeting rooms for free.

The department added that the emphasis would now be on information technology awareness among business people, rather than the general public.

Dennis Blackwell, chairman of a



BENJAMIN... "The funding is not enough."

British Computer Society information technology working party, welcomed the plan, but said it should have been announced a year ago.

"It's a very good idea to keep the momentum going and it's better late than never," he said. "But I doubt whether the amount's much use."

Piracy reaches the end of the plank

by Claire Grouling

SOFTWARE piracy could be at an end if manufacturers adopt the invention of an Israeli professor. Adi Shamir of the Weizmann Institute, has solved the problem of preventing people from making illicit copies of software from one disc to another with a hardware device.

The solution involves altering the disc drive so that anyone attempting to copy software will cause a machine crash. A patent has already been applied for Yeda, a development company linked with the Weizmann Institute. Shamir, an expert in tracking protection codes, set out to find a way of preventing the most common type of software theft, whereby users simply make a disc copy of a borrowed product.

He admits that his system will not prevent determined software thieves, but points out that it is worth stopping the less expert pirates, as he estimates that 90% of business and games software is now pirated.

"It was just a question of finding the key," he said. "The system is cheap to implement and doesn't involve any modification of home computers."

Because the system uses the electronic impulses emitted by the disc drive, software companies will be able to make sophisticated use of it. Certain patterns could be built into programs so they can control the number of times the

program runs — an idea useful for software rental and for companies than for one-time sales.

The system could also prevent abuse of modems, so unauthorized callers trying to tap into someone else's software could no longer software complete with data.

Shamir draws a parallel between the software and the recording industry in the problems of illicit copying. But the recording industry has also tried to deter pirates by making alterations to the hardware and has failed. Shamir's technique, which successfully prevented data being copied on to tape, turns the sound reproduction into a record of the original.

This story has some relevance to Shamir's device. Several years have been made to find solutions to what is, in fact, a ware problem. These solutions cause difficulties for users, who may not be able to make backup copies, which is such as the dongle, which is package into a particular and limit portability, which is increasingly important.

Another problem is the commercial one faced by the houses using a system that depends on manufacturers and their kit. Manufacturers will be willing to spend money on someone else's problem.

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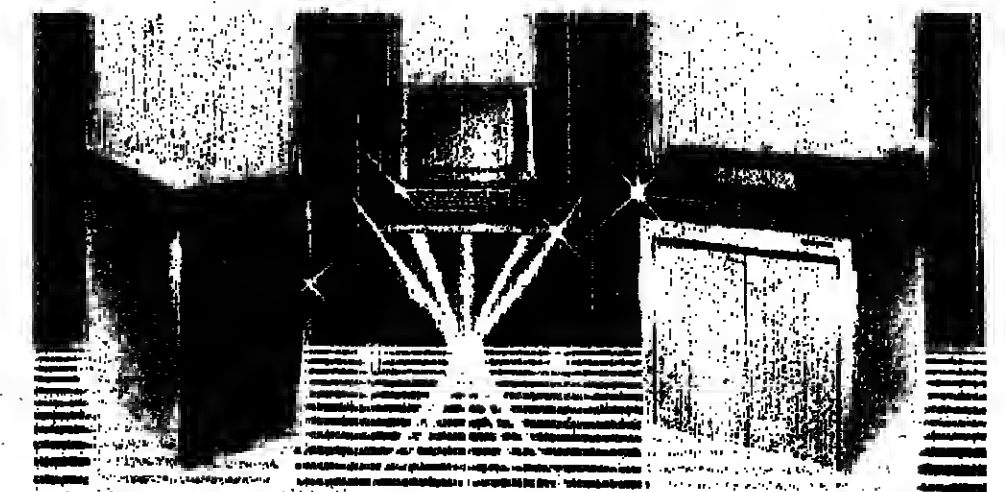
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Banks to share self-service

by Donald Kennett

SHARED networks of self-service banking terminals are becoming desirable and inevitable, according to the president of a leading US shared network operator.

Robert Jansen, president of Texas-based Affiliated Computer Systems, told a Phillips seminar on self-service banking that the benefits of sharing terminal networks were formidable. He warned that smaller financial institutions may need them just to survive.

Automated teller machines (ATMs), whose main function was to dispense cash, had already brought benefits to single-user network operators and their customers,

he said, but these would lead on to point-of-sale (PoS) systems and home banking that would make shared networking essential.

His company, whose Impact network, he claimed, was the first profitable and successful shared ATM network in the US, recognised that it would have to get together with its biggest competitor to tackle the PoS market.

The two biggest nationwide networks — Citrus, of which ACS was a co-founder, and its rival Plus — were already discussing how to co-operate on PoS, though not yet on ATMs.

"The sharing concept has made us the number one proprietary net-

work in the US," Jansen said. "Does anyone here want to do with us? We're ready and willing."

Some of his audience of bank and building society technicians, managers doubted the experience would transfer directly to the UK, as the US has 100 banks and the UK only 14.

But Jansen quoted Leslie Leach, chief executive of the Building Society Association, saying that building societies could provide a full range of retail services including ATMs.

The Building Society Association's council was last week considering a report from CAPS recommending a consortium to operate a shared ATM network.

System cuts fuel bills in schools

by Caroline Burgess

A COMPUTERISED temperature control system in 17 schools is saving the Grampian Regional Council £200,000 a year on fuel bills — a saving of about 20%.

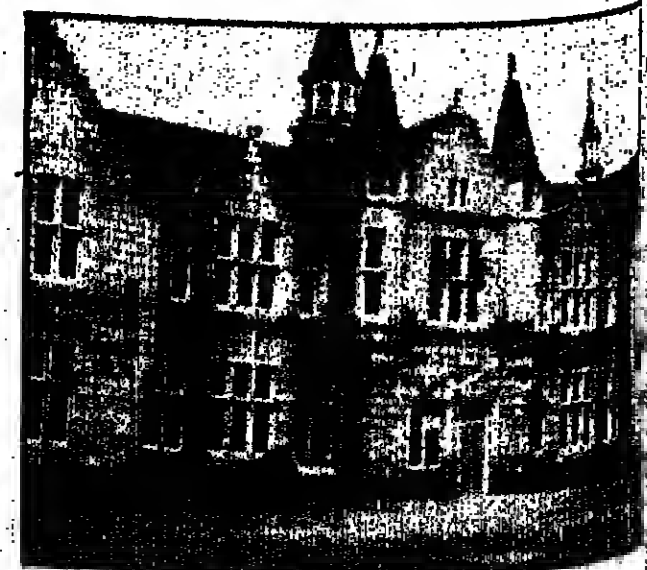
The first stage, costing £250,000, was installed a year ago and covered nine schools. Since then a further eight have been brought into the scheme at a cost of between £15,000 and £30,000 each.

A large number of sensors monitor temperatures, wind speeds, rainfall and the heat of the boilers. Each school has a microcomputer, which collects the information and controls the heating system.

Information is then sent to a central minicomputer via the telephone network. There it is stored on a Winchester disc, and can be viewed on a screen or printed. The minicomputer is in the council architect's department.

Grampian Regional Council has an annual fuel bill of about £9.5 million. It hopes to extend the system to most of its 400 schools, as well as its offices and old people's homes. But money for this is not available at the moment.

Money saved on fuel bills will go to a general fund to help keep the



Fuel bills in schools can be cut by 20%.

rates down. The cost of extending the system has to come out of a different budget.

Atlantic Instruments, a subsidiary of the Scottish company Lyle Shipping, supplied the system after the council put the job out to tender at the end of 1980. The system was designed to meet

the needs of buildings of various sizes and with different heating systems.

It is claimed that the system saves between 18 and 20% on costs, and is viable for any building with an annual fuel bill of £20,000. Atlantic has installed other systems in the UK.

The smaller machine holds sway at Sicob

John Riley visits France's major computer exhibition of the year

THERE are few surprises at France's largest annual computer fair, Sicob, which ends this week. The emphasis in the computer section of this Paris-based, 10-day event is on small machines, particularly multi-user and networked microcomputers.

Many of the foreign exhibits have already been launched earlier in the US and the UK. This illustrates the delay caused by the language barrier in adapting machines for the French market.

Despite the increasing computer sophistication of the French public and the excellent shop window provided by the exhibition, British exhibitors were thin on the ground — only about seven companies had stands.

Several companies, including Digital Equipment, Data General and Prime Computer, presented integrated office systems. Several recently-launched superminicomputers, including Norsk Data's ND-570/CXA and Prime's 9950 machines, were also on display. The IBM System 36 had another airing — the star of IBM's stand. Perkin-Elmer showed its 3205 32-bit processor and announced

Unix additions. Other 32-bit offerings included Data General's Desktop Generation and Gould's PS 3000 machine.

The French company, Logabax, marked its move into fault tolerant hardware with the launch of its Hyper 32, which is a revamped version of its Stratus 32 machine.

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Unix additions. Other 32-bit offerings included Data General's Desktop Generation and Gould's PS 3000 machine.

The French think that if there are problems they will be software problems and not hardware prob-

lems," said a spokesman from Tandem, the Non-Stop computer manufacturer. "It has been difficult to get the idea of hardware fault tolerance across to them."

Small business microcomputers dominated the computer section of Sicob. Most demonstrated multi-user capability or various local area network links.

NCR, which displayed its 9300 32-bit chip, also demonstrated the three buttoned mouse attachment that will be generally available on its Decision Mate V machine in 1984. The new-Hewlett-Packard HP-150 touch sensitive screen micro presented an alternative way of communicating with the computer.

Osborne's stand had, as a result of the company's collapse, been snapped up at very short notice by another American micro manufacturer, Zenith Data Systems, which has been on the waiting list for a place in Sicob's main exhibition hall for a considerable time. It showed a dual 8085/8088 multi-user, multi-tasking, IBM PC compatible micro.

This year has seen much upheaval in the French computer industry, with mergers and de-mergers. Consequently the major French company, Bull, had no new minicomputer offerings, although announcements about its minicomputer strategy are expected soon. However, it has launched a network of retailers and distributors for its multi-station, 16-bit micro.

The recently formed subsidiary of the Matra Group, Matra Micro Systems, announced its plans to produce a 16-bit micro based on Intel's IAPX 186 chip, and announced an order of 40,000 of its current 16-bit micros for the education market in the French-speaking Canadian province, Quebec.

The British presence was strongest in the distributed microcomputer area. Five companies, including ICL, are now tackling head on various parts of that market in France.

ICL was at Sicob in force. It is moving from strength to strength in France — according to a French spokesman, French turnover accounts for 10% of the total company's turnover.

In the main exhibition area it exhibited its latest version of the Perg, the system 25 Model 21, the DRS 20 Model 25, its updated personal computer and its recently launched 9518 point-of-sale terminal.

Scottish-based Future Technology Systems, which recently signed a £5 million marketing agreement with British Telecom, stepped into France for the first time at the exhibition with its Intel 8086 machine, which runs MS-DOS simultaneously with CP/M 86.

Future is hunting for an OEM deal in France such as that recently achieved with Daisy Systems in the Netherlands. "We have been

concentrating in the UK market up to now, but are beginning to spread our wings," said marketing communications manager Mike Smith.

Another UK company at Sicob looking for distributors was Plessey Microsystems, which recently set up a French subsidiary. It was showing off its Motorola 68000 and Multibus-based System 68 supporting Unix. Its sister company, Plessey Peripheral Systems, which provides the maintenance, exhibited its 7500 machine, based around the Digital Equipment VAX 11/750 32-bit minicomputer.

London-based Rair, following considerable success with its Business Computer in Germany after exhibiting it at Hannover Fair, launched the machine in France at Sicob. According to its manager in Germany, Gunther Krauss, Rair now sells more of the machines, based on concurrent 16-bit Intel 8088 and eight-bit Intel 8085 chips, in Germany than in England.

Another London-based micro manufacturer, Shelton Instruments, was at Sicob last year and is now setting up a French subsidiary and arranging to sub-contract assembly of its eight-bit/16-bit multi-user microcomputer, Sig-Net, which is based on a Z80A chip functioning in tandem with an 8088 chip.

Several smaller British home micros were exhibited by distributors in the Sicob Boutiques, a separate exhibition aimed at home and small business computers.

Sinclair, Acorn and Dragon were demonstrated enthusiastically on the stands.

Among the peripherals, laser printers attracted much interest, with Burroughs and Hewlett-Packard both presenting their machines, as well as IBM, Canon and Siemens.

The French company, Bull, believes that it has stolen the laser printer technology's thunder by launching a printer based on a new technology, magnetographic technology, which is claims can print 50 pages a minute. Called the M 9060, the technology involves magnetising heads mounted on a drum, attracting ink powder to the magnetised zone, heat sealing it in, demagnetising the heads and then continuing the cycle.

Control Data, which geared its presentation heavily towards OEMs and engineers, displayed the first 3Vio Winchester disc, its CDC 9270-6, the Crickler, to be shown at Sicob.

The Sicob exhibition is in its 34th year, and has become overcrowded with space scarce. The computer exhibition is cramped into the third and fourth floors, creating a waiting list for newer companies wishing to exhibit.

The organisers of Sicob have been examining another possible venue for the exhibition to the north of Paris, but so far have found no suitable alternative.



DE LANGE . . . "Documentation must all be in French."

Exporters must lose their English attitude

THE difficulties for British computer companies exporting to France are exaggerated, say British companies exhibiting at Sicob. On the contrary, there are many opportunities and a lot of goodwill to exploit if British companies adopt the right attitude.

"The key to success is to make your product as French as possible," said Hans de Lange, general manager of Rair's subsidiary in France, set up last year.

"The main mistake manufacturers make is to be English in their attitude," he added. "Screens, messages, keyboard and documentation must all be in French — that is the key to acceptance in the French market."

An important psychological barrier is the keyboard. In France, instead of starting with "qwerty" it starts "azerty". Rair has a facility that intercepts all screen messages on the front of the operating system, which allows speedy and



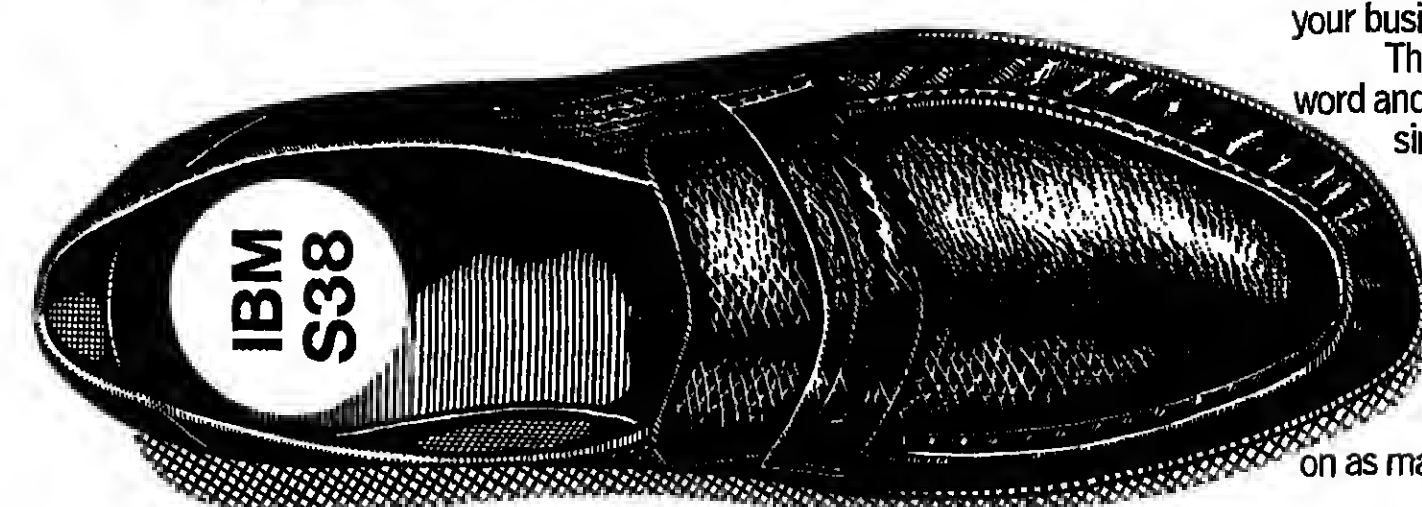
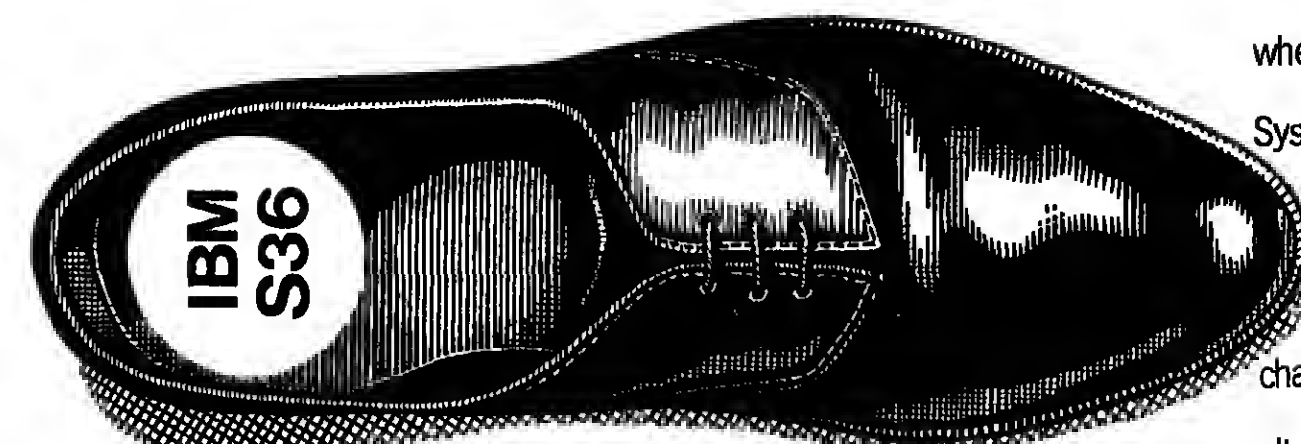
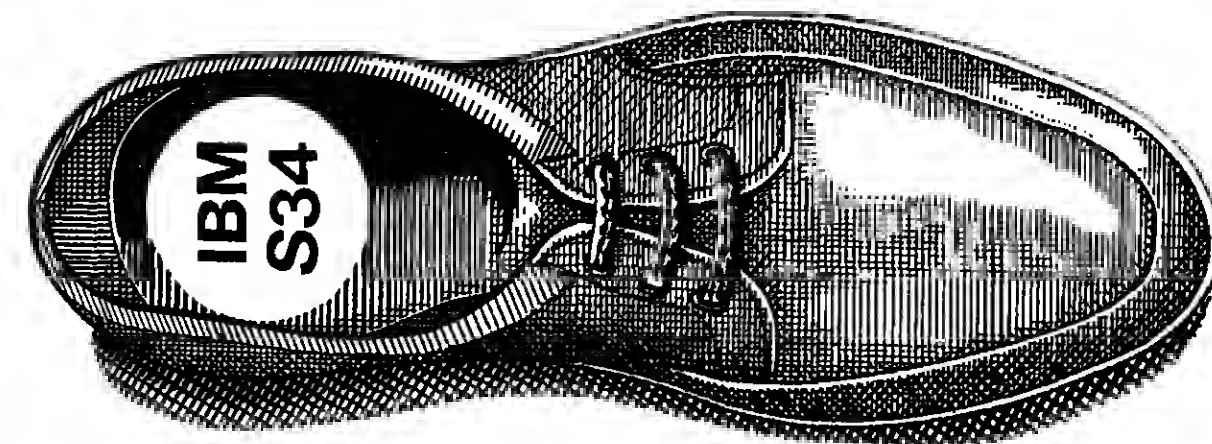
cheap translation of screen messages into any language. The keyboard is "totally soft" and can easily be reconfigured.

Most companies agree that it is important to set up a French subsidiary and also, if they wish to break into the public sector market, set up manufacturing facilities in France.

The advantage of setting up a subsidiary was explained by Chris Shelton, managing director of Shelton Instruments: "We are in the process of setting up a French company so that we can export to ourselves and retain control of the credit control documents. In



SHELTON . . . "We can cover 40% of the French market in a day."



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Cord pulls in NatWest upgrade

A £460,000 contract to upgrade National Westminster Bank's foreign exchange dealings system has been won by Cord Designs of Staines.

This firm came to public notice when it bought Altergo Ireland after the Altergo parent company crumbled earlier in the year. But the NatWest job has been awarded to another arm of the group, the Zeus Hermes division, which Cord acquired in November 1982.

It is the first big undertaking for Zeus Hermes since it came under Cord's ownership and will keep a systems team at the London office busy for a year.

It involves installing 13 General Automation minis at the World Money Centre and NatWest

tower, linking about 90 screens with real time Fortran and Assembler programs.

Zeus' 20 systems experts were responsible for providing the £600,000 network installed by NatWest in 1980.

Cord's identity has been something of a mystery in the industry since it surfaced alongside the much better known Data Logic, of the Raytheon electronics empire, and Thorn-EMI's Software Sciences, as a buyer of the ailing Altergo operations.

Behind it is a small London venture capital house, Innotech, which specialises in high technology investments and one of whose directors is David Sainsbury of the supermarket family.



PENNEY... Expects a revenue jump.

The partnership with Innotech was sewn up at the beginning of 1983, after Cord had talked to about a dozen financial institutions to get backing.

Cord is expected to have an annual turnover of £1.25 million when its trading year ends on September 30, but profit will be minimal, largely because of the recent takeovers.

Marketing manager Gerald Penney expects a jump in revenue to between £4 and £5 million in 1983/4, as two major contracts, with Saudia Airlines company and United Arab Shipping, come to fruition.

Finance modelling takes an Encore

by Claire Gooding

ANOTHER financial modelling system has arrived in the UK to lure users away from well-known products such as EPS-FCN and Micromodeller. The Encore system comes from Perot International, which originally wrote the Micromodeller package for 8-bit machines, but broke away from UK supplier Intelligence UK earlier this year.

The new decision support system takes the principles of Micromodeller up into the 16-bit market. While Perot is anxious that the package should be seen as a new market entry, not just a re-write, Encore will support programs written for Micromodeller (the trade name still owned by Intelligence UK) and Perot's own 8-bit offering, Modeler.

Encore's entry to the market is likely to trigger a price war. The most widely used system, EPS Consultants' FCS, is selling for just under £1,000. Intelligence UK, since its bitter split with Perot, has been concentrating on its own 16-bit package, Modeler 16, which sells for £395.

Encore, which works only on

16-bit machines, is no side UK for £395. The package has been built to take advantage of features, such as windows, graphics and size, with emphasis on ease of use.

According to Perot UK's Terry Thomson, Encore is everything that its competitors offer and more, for a much price. The system includes a spreadsheet which displays windows; an English modelling language; a library; a programming language; a report writer; a graphics and sophisticated window display facilities.

The function library has been adapted to the UK's tax and accounting laws but, according to Thomson, Encore is also relevant to the UK and selling.

We are selling several against Micromodeller and are choosing it in preference to Modeler 16, he said.

Although the product does come on to the UK market, Thomson has orders for 45 copies.

Personnel system on way to UK

A NEW personnel system, claimed to offer more detailed and comprehensive facilities than competing products, will be marketed in the UK soon.

HR+ (Human Resources Plus) originated with Dynation, a small software house in Alabama, from which it was bought by the top financial packages firm, McCormack and Dodge. This firm wants to include it in its forthcoming range of Millennium programs, linking IBM mainframes and micros, and has already installed it at two sites in the US.

It will be introduced into the UK towards the end of the year by RTZ Computer Services of Bristol, the Rio Tinto Zinc subsidiary which also acts as distributor for McCormack and Dodge.

HR+ is seen as posing a threat to established payroll/personnel systems, such as PPL's Cyborg system, MSA's Q-Pac and Peterborough's Unipersonnel.

Education centre opens

A PURPOSE-built education centre in Maidenhead, Berks, run by software industry leader MSA opened on Monday.

It accommodates up to 200 people, with 50 terminals for on-line training, as well as a lecture hall, workshops and audio-visual facilities.

Chief executive John Inlay said the centre, staffed by 15 of MSA's training division, made the firm the largest independent software education enterprise in Europe.

Software File is compiled by George Black

OS designed for Japanese machines

MICROSOFT has introduced an 8-bit operating system in 2" which will be the standard new range of Japanese home computers. MSX-DOS is designed to be made by 15 new micro manufacturers to be launched in the UK next year.

The Japanese group, which includes NEC, Fujitsu, and the approached Microsoft, want DOS system was adopted by 25 for its PC, and manufacturers' trade for a joint developer project on the home computer standard MSX. Companies include Zilog's Z80A chip, for instruments' video processor and Microsoft's M-Basic language.

The system could give large and US software writers and the previously inaccessible Japanese home computing market.

Range extended

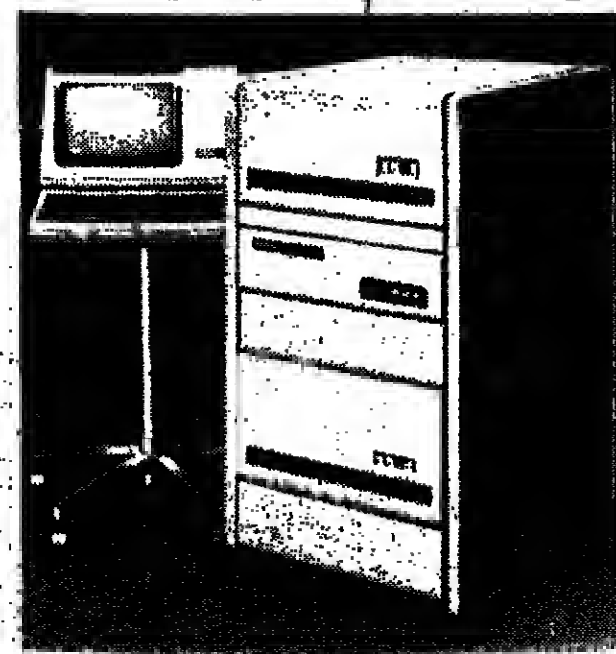
DYNATECH Microswan, a Codewriter program group, has extended the range of products from the IBM PC to Commodore machines and Apple II and Sirius/Vision. Dr Thorne, chairman of the group, said orders were from 5,500 to 5,000 a month.

Fee for Online

WATFORD software house is to distribute the Online Sales International range of products previously marketed in the UK. They include the basic CICS applications system, CICS security system and IBM mainframe-micro called Omnalink. Fee is about 70 former Circle users using OSI products.

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LAMOND
THE IBM PC IN
CORPORATE DATA
PROCESSING

24-25 November 1983

MICRO NEWS

Texas moves into standard cells market

by Keith Holder
SEMI-CONDUCTOR manufacturer Texas Instruments has moved into the standard cell technology market with devices to offer greater flexibility in design.

The first batch of devices is compatible with existing CMOS catalogue functions but allows the designer to amalgamate chip precursors into a single unit, saving both on silicon and space. Thirty devices are already available and they will double by the end of the year.

Texas' European semi-custom manager Barry Cooper described the move as "a milestone in the TI semiconductor group".

Development plans on a number of products are already underway. Linear functions are promised for mid-1984 and cell cores for microprocessors by 1985.

Designers will face a 16-week delay from design to completion, though a company spokesman said this would reduce to about eight weeks next year. Manufacture of designs is carried out in the US at present, but a European site will be operational soon. Manufacture in the UK will be at the company's Plymouth facility.

The main European site will be at Bedford, where designers will be able to get advice and help using the company's design tools. Designs can also be tested before committing them to production at the centre.

The company is keeping quiet about the size of its investment in this venture, but a spokesman said it was very large.

The market for standard cells is expected to increase as designers look for more effective use of silicon.



COOPER... "A milestone in the semiconductor group."

France panics as chip prices rocket by up to 1,000%

by Jack Gee
FRANCE'S computer industry is lagging behind Britain and West Germany in the rush to buy microchips and its orders are expected to rise this year by only 13% in value, and 1% in volume, compared with an average annual increase of 20% until now.

A mood of panic has seized French electronics and computer manufacturers in recent weeks following rises in chip prices ranging from 70% to 1,000% by Japanese semiconductor firms.

Although confidence in the future of France's five-year electronics plan is weak, manufacturers are now ordering chips in fear of being out of stock when demand for their products picks up again.

They believe that, although their economy is stagnating and zero growth could last for at least another year or two, they might also have to contend with a worldwide dearth of chips.

The only sector of French in-

dustry which has immediate requirements on a big scale for microchips is the defence industry. Chip orders have increased tenfold in the last few weeks.

Electronique Actuelle, leading French trade journal, warned recently that orders who lacked foresight will see deliveries of C-MOS and S-MOS memories until next year.

Orders for integrated circuits the free market in France are running 50% below the level for some time last year.

Cutbacks in consumer electronics, French nuclear power, and have seriously affected demand for chips incorporated in control systems.

Chip makers regard France as an unpromising market compared with Britain, now the top selling area in Europe and criticised recently as "an economic boom" by Dedy Sahar, vice-president of European marketing.

Competition heats up for A4-size portables

by John Kavanagh

LESS than a year ago Epson was one of the stars of the Compuex exhibition with its A4-sized portable computer. Here was a "real" programmable computer, which you could put in your briefcase.

Epson has had the market largely to itself until the last two months, which have brought A4 competitors, launched by Tandy, Convergent Technologies and Olivetti. These firms have had time to note Epson's approach and form their own opinions - and the results have been very different.

The Epson 11X20 is from the Japanese firm Seiko. Tandy and Olivetti are selling a computer from another Japanese company, Kyocera, which is purely a manufacturing concern. Convergent Technologies has its own product. Epson offered a miniature version of a full computer system, with a keyboard, small display, narrow printer and tiny tape cassette all built in. The machine costs £411.

Kyocera has dropped the printer and tape unit; instead it offers a big display, with eight 40-character lines.

User memory starts at 8K and goes up to 32K. There are built-in interfaces for printers and storage peripherals. The machine runs Basic from the US firm Microsoft. This is supplied as a read-only memory. The processor is built around Intel's 8085 eight-bit CMOS processor. Prices start at £500.

General applications available initially include word processing, address book and diary. But the suppliers are talking to dealers and

software houses about package-specific industries.

"Executives will use it as a portable tool," said Gammal, microcomputer product manager at Gammal. "But a portable market is among big panics, with one application insurance company, for example, might give one to each rep. program to handle quotations could sell thousands into our company this way."

Epson has had success in type of market, with sales firms developing industry packages. The company said there is a "vast number" of packages available.

Olivetti calls its machine M10 and fits it in at the bottom of its M20, M30 and M40 line microcomputer range.

Convergent Technologies added firm out. It has gone single application with Workmate - spreadsheet modelling - but also offers services such as a telephone machine, dictating machine, alarm clock as standard for \$895.

The Workmate is not portable in the ordinary sense, applications which are done as rows and columns can be developed by users.

Convergent Technologies' agent Alan Michels says that the competition by using businessmen did not write their letters using word processors, they did not need such packages. With Workmate they could get them into the machine in the way.

£850,000 helps 32-bit

by Caroline Burgess

OXFORD-BASED Hytec Microsystems has won £850,000 to develop a 32-bit microcomputer and an operating environment - a 16/32-bit operating system which will provide interfaces for communications and networking.

The investment comes from the sale of 18% of Hytec's equity to Newmarket (Venture Capital) for £450,000, a software development grant, and more money from its founders.

"Taking mainstream development and putting that sort of system on a micro," is how Chris Swinbank, one of Hytec's founders, described the project. The move straight from its present

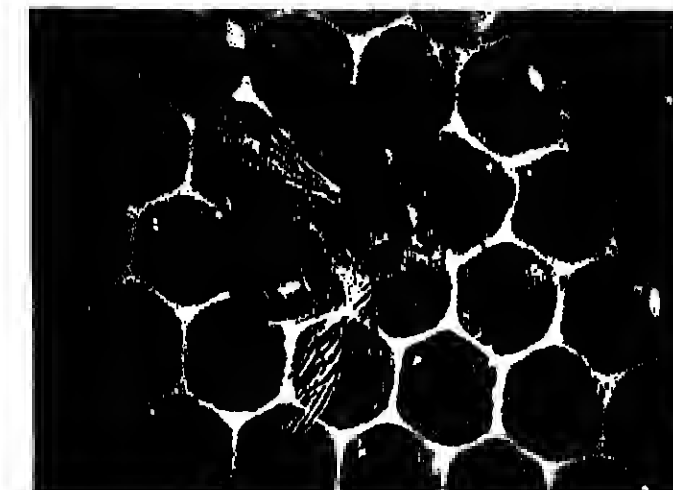
eight-bit Prelude to a 32-bit machine is a bid to break into mini and small mainframe markets.

Hytec see this market as a growth area of the future, don't want the current hype to end," said Swinbank. The development of the new system, which may be as a joint project with Oxford University, is expected to be completed by 1985.

The software development support other 16/32 bit operating systems including CP/M, DOS and Unix, as well as providing communication and networking facilities. Hytec expects its first stages to be implemented in the next two months.

Micro News is compiled by Robert Parry

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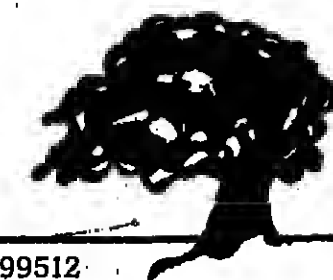
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PROFILE

A boss with the 'Buy British' bent

PETER HEAVEY does not pretend to be an innovator. His company Tribestar rolls in the wake of Digital Equipment, making terminals compatible with the DEC VT100 terminal.

"We are living off crumbs from the rich man's table," Heavey admits. However he thinks his crumbs are the best.

He says he can offer a terminal that is a sleek, low version of the VT100 while at the same time being cheaper. The latest offering is the TT102 plus, which incorporates features of an earlier VT100 look-alike with the addition of tilt and swivel of the screen. There is also an extra large 15in screen, and a choice of screen colour. The VT100 keyboard has been redesigned as well.

The TT100 was originally made

by Philip Hunter

by Trident Computer Services, better known as a supplier of contract programmers.

"Trident wished to cease making and marketing this because it was alien to their business," says Heavey.

So it stopped Tribestar last February to negotiate a manufacturing, marketing and dealing licence. Trident still picks up royalties for TT100 sales.

Tribestar now builds the terminals at its factory in Milton Keynes and Heavey looks forward to moving into fresh pastures and severing the ties with Digital Equipment.

This will have to be done if the company is to maintain its growth, since there are 50 UK companies

making DEC-compatible terminals and it will only be a matter of time before others match the features of the TT102.

One possibility is to put more intelligence into the terminals, but there is no commitment yet. "We will wait and see how developments go," says Heavey. "We could put a micro together now if we wanted."

But plenty of other people are doing that too, and Heavey's more immediate concern is with DEC's next terminal, the VT200 range, already replacing the VT100 in the US.

Surprisingly Heavey has not yet started work on a VT200 compatible terminal, although he says he can move fast when it comes to the UK at the end of the year.

After that Heavey hopes to build terminals and monitors for other UK companies at his new factory.

He is keen to emphasise the patriotic bent of his company, even though he is indirectly helping DEC sell its machines.

All the terminals are assembled in the UK. "Everything is bought from British companies; we don't import anything," he boasts.

The driver board, logic boards and some of the keyboards are still made overseas, although Heavey says Tribestar later this year will build the logic boards under licence.

Heavey's computer background includes nine years with Control Data, a company best known in the UK for its supercomputers, mainframes and the Plato computer-based training package. Less well known is that the US giant has for some years in the US had a business advisory service, set up to



HEAVEY... "Crumbs from the rich man's table."

help small young companies and as a curial spread the Control Data net wider.

Heavey's last appointment with Control Data was with a UK subsidiary set up to model the business advisory service in the US.

This, explains Heavey, was based on a talent pool of external consultants available on request. "It provided the middle-aged senior executive with the opportunity to control the success of a smaller company."

There were three types of advisers: people with general business experience, more technical people who could help companies with their first computer purchase, for example, and Control Data staff who were allowed to be registered on the talent pool.

But Control Data had it all wrong. Heavey contends, "People in small businesses often know what to do and never do it."

So Heavey and his wife Beryl, who also worked for Control Data, left to set up their own company to assist small firms.

"Rather than tell them how to run their business, we simply take over the calculation of cash flows, overheads, sales and production levels," says Heavey.

This venture is still ticking over, but all the spare cash has been sunk in Tribestar, which Heavey says is set to turn over £1.3 million in this year ending July 1984.

"In the last two months, we have sold over 50 TT100s," he says.

PLATFORM

David Scanlon is marketing manager of System Industries.

Customers should not put up with the waiting game

WHEN it comes to breach of promise, some computer companies have more to answer for than any run-away bachelor who left a jilted bride crying at the church.

For the insidious practice of announcing products which are due to arrive months or years ahead - and in some extreme cases never do - has bedevilled the computer industry for years.

Waiting for a product to appear from one of these companies can be like watching a pregnant elephant. It can be a very long wait before anything interesting happens.

We have now reached a position where the practice of announcing products so far in advance of their appearance is seriously damaging to computer users and suppliers.

Yet the marketing men of the computer industry used to think it was such a clever ploy, especially if you were one of the giants of the industry. As the argument ran, if you were a large company with a substantial user base and in-built customer loyalty, you could keep your customer hanging on in eager anticipation for months for your next product offering.

That ploy had the added and all important advantage of keeping those irritating plug compatible manufacturers, who might not be able to offer your customer's equipment which existed now, at bay.

But that thinking, which may have been clever then or even five years ago, is fast changing. Computer users are much more sophisticated than ever before, and are rapidly getting wise to these ploys.

Many have had their fingers burnt by companies which promised products in a specific timescale but which appeared late - or even never at all - and to a different specification.

Even more important, we now live in a time when technology is changing faster than at any previous period in the computer industry's history. The personal computer market is possibly the extreme example of this.

The latest, state-of-the-art, whizz-bang machine is, one year later, as dated as yesterday's newspaper. New technology and new applications of new technology rapidly tumble upon each other.

In this environment of rapid change it no longer becomes a sound marketing plan to announce new equipment too far in advance.

After all, what kind of technology will a customer get from a product finally produced as much as two years after it was first announced? Will it be outside edge or inside edge technology?

The fact remains that no company can base a product on technology which does not exist, and it is simply not possible to be precise about the technology which will be available two years hence.

A company which now announces products so far in advance is not really exercising sound marketing judgment. It could so easily be a recipe for deteriorating customer relationships.

Two things tend to happen. First, as so often with long de-



velopment schedules, a programme slips. A 12-month job becomes 15 months, and finally 20. What happens the customer, waiting on the hooks, while all this is going on?

Salesmen will be raising their rapidly offering him plenty of excuses, and even lavishly hospitably to assume the ger because the product he promised is not available.

When the product finally arrives, that customer will be less likely to excuse any late problems than if the product had been delivered from stock at a brief waiting period.

He will, quite reasonably, view that as the manifest lack of respect for his time. It is not long to wait for a product, but it is long to wait for a product which is not what he wanted.

The message is one which a wise customer should heed: a happy customer.

Moreover, this approach to selling can have a serious effect on the customer's development. If a product is promised late, a customer may be programmed to expect late delivery with that date. A delay therefore has a devastating effect on his reputation.

So what is a reasonable person's advance notice to give to a customer? My view is that it is about 12 months - and that should be to almost every kind of computer product, although some companies with some products will not give considerably less notice.

For certain concepts which are announced, it takes a considerable time for products to appear. A real disc is one example. There is a difference between announcing a general intention to produce a specific product and making a specific commitment to produce a product with a set of specifications.

What should a company do when he is approached by a supplier who promises a product way off in the future? The answer, I suppose, is to show the door.

But probably some things need to be given to the supplier. First, if the product has a specific specification to a product which is already available on the market, what is the point in waiting for a new product to appear - especially if it is going to be considerably more expensive, which is usually the case.

Secondly, if the manufacturer is offering a significantly superior product, other key questions need to be asked. How realistic is the timetable? Is he offering the most important, will the technology be in the product by the time it appears?

In the end, the reality of the problem lies in the hands of the customers. They should make it clear to suppliers that they are prepared to put up with the promises of products which may or may not appear at an unspecified time in the future.

David Scanlon

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, September 29, 1983

Will Edwardes get ICL manufacturing?

Q: WHEN is a surprise not a surprise?

A: When you should have seen it coming.

Last week's news that Sir Michael Edwardes was to succeed Sir Christopher Laidlaw as chairman of ICL came like the proverbial bolt from the blue. But were the signs there for all to see?

There appears to have been little doubt within ICL that Laidlaw was about to retire, despite official denials, the last of which came only 24 hours before the official confirmation of his departure. And although the company is understandably reticent about discussing details of how the board reached its decision to approach Edwardes, it appears that the ex-BL and Mercury boss was number one on a list of one.

One of the most important qualities which must have drawn ICL toward Edwardes is the high visibility of the man. If it is possible to criticise Laidlaw's chairmanship, it must be in this area - Robb Wilmot was the young, dynamic whizz-kid, while Laidlaw was overshadowed in the eyes of the general public, appearing rather conservative.

Edwardes, on the other hand, is a household name - a name which will undoubtedly attract many small investors, and those pension funds and other institutions.

But more interestingly, could the appointment of Edwardes herald the return of ICL to manufacturing as opposed to badge engineering? His background lies solidly in the manufacturing area - something which cannot be said of the current board.

ICL still has both the hardware and software expertise to design first division products, and there are many who would welcome the return of ICL to the manufacturing area. Edwardes would be just the man to do it.

Laidlaw steered the company through its traumatic financial problems of the last three years, but the time may now be right, and ICL stable enough, for a more adventurous approach to management.

In Wilmot and Edwardes, ICL has one of the best teams in UK industry - if not the best. It will never have a better chance to establish itself as a dominant force in world terms. There can be no excuse for failure.

No more heroes

THERE are no more computer heroes. That was the sad message from the programme chairman for IFIP's ninth world computer congress in Paris last week.

Dionysis Tschiritzis, the man behind the five-day programme of more than 100 sessions, lamented the passing of the "old days". He reflected that the old days were akin to a classical orchestra, whereas the computer industry is now more like pop music - unknown kids in basements are creating computer programs that are having enormous effect.

Computer programming, he said, stretching his analogy even further, is more like pouring concrete - we no longer know who does it. And Tschiritzis' obvious fear was that at the 10th world computer congress, to be held in Dublin in 1986, there would be new faces and new memories of the history of the computer industry.

It is always sad when a good party breaks up as the dawn comes. And Tschiritzis should be allowed his nostalgia, for it has been an exciting time since IFIP, the International Federation for Information Processing, was founded nearly 25 years ago.

But he goes too far when he heralds the death of computer heroes. What he really laments is the ending of a tightly knit group which had enormous influence on the development of the industry. And he is also lamenting the waning influence of the large machine, supplanted as it has been in so many applications by the microprocessor.

If there were ever heroes in the computer industry, nothing has changed: Steve Job of Apple, Clive Sinclair, Chuck Peddle, Bill Gates of Microsoft and Gary Kidall of Digital Research might all have a claim to such an accolade. And that most wily of computer architects, Gene Amdahl, is not finished yet.

1984 and all that...

THIS week's example of the strange things people say about computers was sent in by J. A. McCurdie of Winsted, Cheshire, who wins £5.

She reflects on her own observations: "He has an athletic figure and is very agile. Last week I found him for runs up a ladder. He says things like 'doggie', 'oh boy', and 'oh dear'."

What he really needs now is a computer.

Sunday Times

LETTERS

Alvey director on the right track

YOUR interview with David Talbot, the Alvey Programme software engineering director, *Computer Weekly*, September 15, shows encouragingly that he at least is on the right track.

My chief aim is a little further along the way. As he says, it is not the amount of money invested, but the value we get out of the system that matters. This suggests immediately that what goes on between the two should be the subject of scrutiny. Too many times in the past have British ideas and inventions, often backed with substantial sums of money, been allowed to dissipate themselves in the general morass.

Talbot's observation that IBM did not capture the market with its PL compiler gives a further pointer. For IBM has since learned

that, mighty though it is, even it cannot be totally self-sufficient. It now buys in microprocessors and technology at one end, and at the other end sells through independent retailers.

Now other mainframe manufacturers are following suit rapidly, and the busy shielding their xenophobia. This factor coupled with the enormous driving force of the micro sector is leading to the emergence of a highly structured industry, with individual firms becoming more specialised and restricting their activities to specific layers within the distribution chain.

The whole scene from chip manufacturer to the end user marketplace, must be viewed as an entity, which is as strong as the weakest link in the chain.

The general success of the Japanese is largely attributable to the close attention they give to ensuring that they have a complete structure for the industry concerned. In America the climate seems to favour healthy natural growth. However, in this country we must take action to create a rational and balanced structure within the industry as a whole, so that it provides a servo effect to investment, thereby creating the value for money that Talbot is looking for.

If Alvey can bring about a soundly structured British computer industry then they will have made a lasting contribution. It is not any investment will be wasted.

R. J. R. REDBECK
James Ross Associates
Walton-on-Thames.

The CPM-86 and MS-DOS battle

YOUR article on 16-bit software (*Computer Weekly*, September 8) is puzzling. Is the great battle between CPM-86 and MS-DOS purely a media event, or can anyone join in?

Over 100 Sirius computer users in Edinburgh do not care two hoots about either of them, and have rejected the screen monitors

given away with their machines in favour of the TCSID p-system.

The following article in *Unix* is extraordinarily dismissive of this operating system, not recognising that Unix and the p-system do not compete in the "personal" computer arena at all.

Are you genuinely ignorant, or is there something more sinister going on at your newspaper?

S. J. W. DRUITT
SIA Computer Services
Edinburgh

The Editor welcomes letters commenting on subjects published in *Computer Weekly*, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

Redundant authority

WAS there a hidden reason for the decision to publish the article in *Computer Weekly*, September 15, which was of Wimbledon Town Hall not part of the London Borough of Merton?

Since they did not get a mention in the article the only reason I can think of is that it illustrates a typical local authority situation - redundant and scheduled to be demolished!

W. P. FEATHERSTONE
Technical Officer
Customer Computer Services
National Westminster Bank
London

Gem Equipment

GEM Computer Equipment of Chelmsley, Lancashire would like to know if there are any way connected with Gem Systems who were subject to a report (*Computer Weekly*, September 8). We totally disagree in the supply of new and refurbished computer from handling equipment.

MIKE JACQUES
Gem Computer Equipment
Chorley.

DOWNTIME

Baffled boffins

IT'S a painful sight to see the world's computing intelligentsia totally baffled by a computer - but that is what happened at IFIP '83 in Paris last week.

Someone decided that space-age communications would be the thing to have, so the French PTT promptly stepped in to set up an electronic mailbox system for delegates, running on the Teletel videodata system. They even gave everyone a plastic card with their own secret mailbox code, and installed terminals all around the Palais des Congrès.

Seldom can technology have produced so little result for so much effort. Throughout the opening days, delegates could be seen scratching their heads and vainly stabbing at buttons.

Cries of "This system is not user-friendly!" were to be heard in a variety of accents.

Despite the fact that the official language of the meeting was English, most of the instructions were in French only. After much fumbling just to get the thing started, a user would find the machine telling him "TAPEZ (enter) SUITE". So he would press Suite, only to be told "TAPEZ

SUITE" again, and again, and again. Obviously the French were trying to demonstrate their profound grasp of recursion.

Your reporter succeeded in getting to the stage of typing in his secret code:

JYT71
and was told over and over it was "INVALIDABLE" (invalid). Hands up all of you who guessed that the character on the end was not a one, but a 7!

FRANCE got rejected as an "ILLEGAL COUNTRY" (it should have been FRA). Then a delegate tried to send a message to Jean Carteron, chairman of the organising committee, and was told he did not exist. It seems that Carteron had never actually registered at the conference.

Much anguish was eventually ended when the system broke down altogether. Not before, however, the broadcasting service had come up with some real gems. A session chaired by the Soviet academician Andrei Brashov, entitled "Tough nuts to theoretical computer science", was advertised as NUTS IN THEORETICAL COMPUTER SCIENCE.

In the name of art

AS a diversion from their weighty deliberations, delegates at IFIP '83 had the chance to go to an evening reception at the Centre Pompidou to view a display of computer art.

It was interesting to get a close-up look at this celebrated latter-day palace of culture, and to admire how the architect had succeeded in disguising it as an oil refinery.

Mind you, I fear his intellectual integrity in refusing to cover up the mechanical parts of the structure seems to be backfiring: substantial patches of rust are now appearing on the framework.

Still, the delegates got to the top floor without anything collapsing and were rewarded with an impressive view of Paris and plenty of conviviality. There was an inextinguishable mismatch, however, between the number of seats at the tables provided, which was just right for the number of guests, and the quantity of food, which ran out.

One would have thought that getting the two to correspond would not be mathematically very difficult.

And the computer art? With some effort one could see spaced around the walls various pictures,

which turned out to be the most trivial examples of computer art to be seen for many years - pretty spirals, sheets of printout with patterns of zeroes, that sort of thing.

Commented an Italian delegate: "I think the designs for integrated circuits make better art."

So much for much-touted French culture when it meets much-touted L'Informatique.

Harmony

THE mind tends to wander during boring presentations, and there were plenty of those at IFIP. Sometimes the results can be serendipitous, though. One Dutchman, listening to endless talk about error-tolerance, came up with the idea "Why not build an error-tolerant musical instrument? Then it would not matter when I made mistakes in playing - the correct music would still come out."

Great idea, but with a few technical problems to be overcome, I fear. Perhaps it would be easier for the musicians to find some error-tolerant listeners.

Chad

Liveware File

by Don



10 YEARS AGO

FROM COMPUTER WEEKLY OF SEPTEMBER 27, 1973: "Data's Call 378 time-sharing network became available to UK users via a transatlantic cable link... Lord George-Brown joined the ranks of Diebold Computer Leasing... Over 200 exhibitors put their wares on show in the Business Efficiency Exhibitions at Olympia... reported an operating profit for the year of £32 million, 47% below the previous year."

David Scanlon

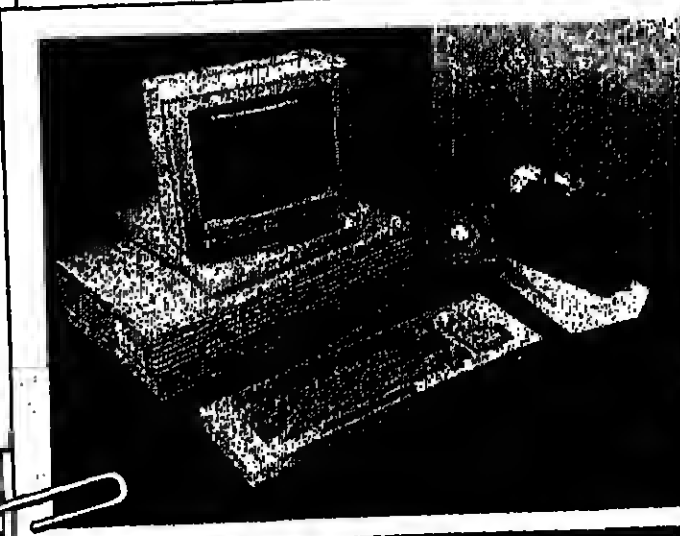


10 Downing Street
Whitehall

Dear Bill

Strongest thing, the Boss actually invited me into her office for a quick snifter this morning. Couldn't believe it, told the flunkey she must have the message wrong. I mean, you know how secretive I've always had to be about light refreshment before lunch.

Turned out it was the only way she thought she could get me up there. Into one of her Bouts of Enthusiasm, that's what it was all about. If I'd known I might have taken a nifty diversion into the back garden and asked if I could do some advance work on the pruning. Anything's better than the Boss having a B of E.



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As it was I got clobbered with a barrage of whizzing and whirring noises from her all about some new computer she's got. You remember what computers are - that All Electronic Show you got dragged along to was littered with the little devils. Even the chap next door's got one for eerting out his tax. Anyway, the Boss sent me down in a rather uncomfortable chair, propped on empty glass in my hand (yes, empty). I didn't dare mention the fact, and started outgloating about this box of tricks on her desk.

A micro with the power of a Mini was how she described it. Eager to show I'd been listening I said I had no idea those yobboes at BL had got off their backsides and started cranking out something called a Micro. Bit of a cliff-hanger that. She gave me the piercing blue eyes treatment for a few oces, then came out with the info that it was called a Fortune 3216. Jolly good I said, standing by some clean-shaven, clean-suited, and no doubt clean-thinking young man who apparently popped out of nowhere. Turned out to be one of those new-fangled computer walloas. She'd wheeled him in especially for the occasion, and I had to sit through half an hour of seelie chat.

Apparently you can buy this Fortune 3216 for as little as £5,000, and they breed like rabbits right up to 8 intelligent workstations, whatever that means. I suppose while the Boss is upstairs sorting out the old balance of payments, I could be knocking out the odd letter on the word processor. The computer willn add its memory power could be increased by just adding something into the back. I can think of a few people around here who could do with that. Anyway, she says it's an easy to use one old fool could master it. Didn't like the way she looked at me when she said it though.

The Boss reckons that a few of those yobboes around Whitehall could save so much money that we might get the tax cuts next Spring after all. I've intimated to the wide boy next door that in such circumstances Excise Duty should be a priority. Pretty heady stuff all this, so I occlona o snap of the machine, and some coupon which will bring lots more information winging your way if you'll fill it out properly and send it off.

Dms

WORKPLACE

Survey shows sackings doubled in six months to April

The staff sale of the century

DEMAND for real time programmers in defence applications has rocketed in the present cold-war climate. But the employment situation in the industry generally is uncertain, and employers feel obliged to keep the staffing levels at their large data processing departments to a minimum.

In the latest survey by Computer Economics, a research company which twice a year polls 500 IT departments employing 35,000 people, it is suggested that the number of sackings doubled in the six months from October to April 1983.

The significance of this figure is doubtful because the sample was small, but it is certain that some companies have trimmed their permanent staff. And the pick up in the contract recruitment market this spring suggests that some firms are reluctant to rush into taking people on permanently until they are sure the recession has finished.

The difficulty that less well-trained people have in finding permanent work in the computer industry was highlighted when 450 people were made redundant by the maker of printing and photo typesetting machines Linotype Pal.

Linotype got together with Inbicon consultancy, which owns Leasco Software, in an attempt to sell the 450 people as a single workforce, offering a range of skills in hardware, engineering, operation and production.

Sally, the venture has not yet proved successful. About 45 have been taken on by Inbicon, which took over part of Linotype. And some others have found jobs elsewhere through their own efforts, but there are still 200 left to be found jobs for.

"I really am surprised and disappointed we have not made more headway," says Dennis Henry, who heads Inbicon's interests in Scotland.

But Henry has had to contend with a surplus of capacity in electronic assembly. He says he got worried when other electronics firms such as GEC, STC, Dragon and Osborne, announced redundancies. But he also says he has had some near misses.

The reply from the 1,000 companies mailed directly in the US, Japan and Europe usually began something like this: "We regret that we have no need for people at the time being."

The 450 redundancies were announced in April, but have been put into effect in stages, and the 200 people that have not yet been placed are still on the Linotype payroll.

Linotype personnel manager Alan Robson says that these last 200 people will be made redundant by December; so a last ditch effort is being made to find them work in the Cheltenham area.

But, as the original idea was to sell the 450 people as one job lot, with a balanced range of electronic assembly and engineering skills, a slight change of tack is called for.

"We have to recognise that the thing we have to offer becomes more diluted," says Robson. He points out that, so far, nearly everyone who has actually been made redundant has found work, apart from those who aren't working because they are choosing not to.

Whatever the final outcome, few workforces can have had so much money spent trying to find them work. But Robson hints there is a limit to how much longer the effort can go on.

Today—a woman's place is on the board

IT remains to be seen how successful next year's Women into Science and Engineering (WISE) awareness campaign will be at bringing a healthier mix of the sexes into technical jobs. At present the more senior the position the less likely a woman is to be found occupying it.

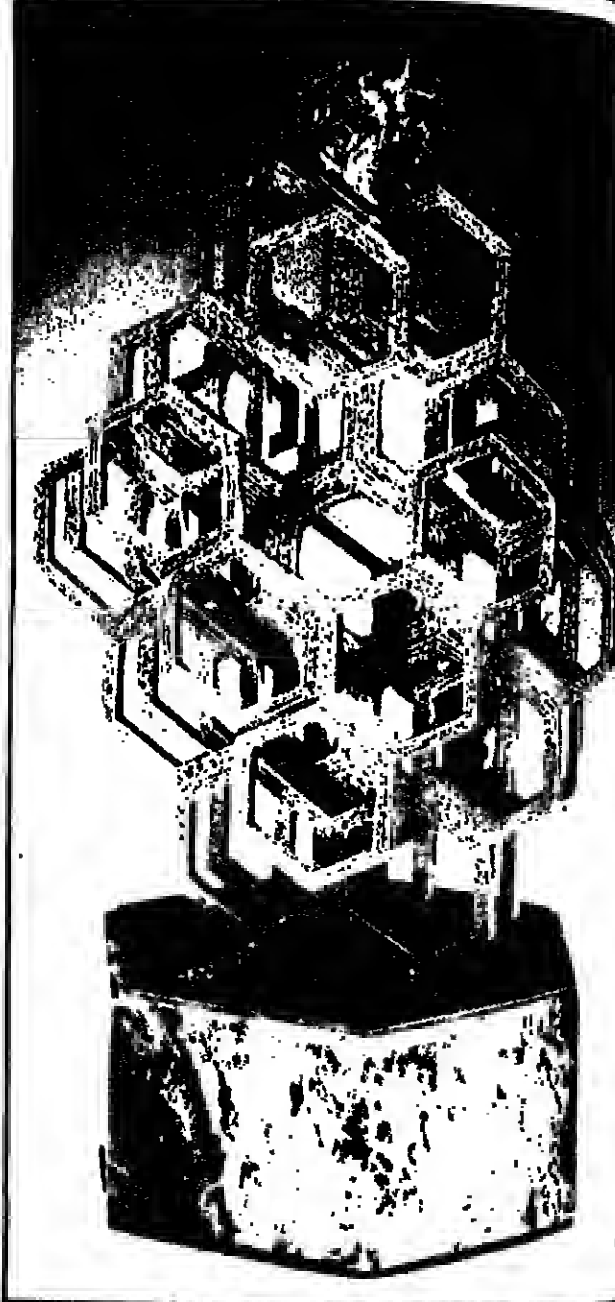
But Philips Business Systems seems to have got the message, because it is sponsoring the 1983 Women Mean Business Award, along with Options magazine.

The winner will receive the handsome trophy shown in the picture, together with a well-earned fortnight's holiday in Jamaica, courtesy of the island's airline.

The burning question is: How successful have the two sponsors been at bringing women into key positions in their own companies? Options magazine has its hands clean, as it has at the helm editor Sally O'Sullivan. Philips Business Systems, however, candidly admits that women have not been very successful at finding their way into its top management. The company has five directors, 40 general managers and about 45 managers. About five of the managers are women, but none of the general managers or directors is.

The company says that it does not discriminate in either direction, but it hopes that more women will come into top jobs, and points to its sponsorship of the business award as evidence of its intent.

Entry firms are in this October's edition of Options. Applicants receive a complicated questionnaire, which in last year's first competition (not sponsored by Philips), weeded out the feeblest.



TROPHY... but are the sponsor's own houses in order?

Examples from 4,000 entries. Applications close on November 30, after which six finalists will be chosen from a shortlist of 12, who will spend half a day explaining how they run their businesses.

Reg Parry, public affairs director for Philips Business Systems, says: "We are delighted to be sponsoring this award because it helps women achieve their potential in today's business world."

Norwegian software for database holders

A THREAT to the dominance of dBase II in the market for database managers on personal computers has just emerged from a small Norwegian software company. Oslo-based Norsoft has released Vista, which unlike dBase II allows the user to store many different types of document in one file.

Douglas Gilbert, who wrote part of the package, says that it will be slightly upmarket of dBase II, selling for around £700 after its first exposure to the UK market at the Which Computer Show scheduled for next January.

The company claims that Vista, unlike dBase II, is a genuine database management system, as it does not have a file structure. All information is stored in a single file under key words, which can be used for sorting.

Any combination of sort keys can be used on one single document, which also gives it a lead on rivals.

Vista has been bench tested against dBase II on a simple application to maintain the subscription register of a magazine. There were 1,221 individual records.

There was little difference on sort and search times, but Vista was much quicker on editing, taking only one second for one sample edit compared with over six minutes for dBase II.

This, of course, is an extreme case. But the most important thing about Vista is that it is easy to use, as dBase II has often been criticised for being hard to learn. I tried Vista myself and found it delightfully easy to generate a simple database with. If dBase II is more complicated, the comparison should not be laboured as

Vista is less powerful as a report generator than as a data creator and manager.

A one-user Vista system on two floppy disc drives can hold 1,500 to 2,000 records of a particular holding, say, details of a particular customer in a customer database, depending on the number of records kept.

So far, 100 such systems have been sold in Norway. But Norsoft is working on a 16-bit four disc version, which will cost £1,400. This will allow up to 10,000 records of one type or 30,000 records in total on one disc base.

"The company says that Vista is a hard disc version, speed which improved up to 10 times, and access times to less than a second by implementing enhanced CP/M. In practice however, the user who wants to handle more than 10,000 documents will be better off with a bigger system."

PUZZLER

TWENTY
FIVE
TEN
TEN
TEN
TEN
EIGHTY

If I tell you that TEN is not divisible by ten, is the number aha-mot, you should have difficulty in solving it. See you for solution.

PEOPLE



Lester C. Falcroth (above) of Arlington, Texas, has been appointed chief executive of Cable TV Construction, a UK consultancy and contractor to cable franchise applicants and cable operators. Previously vice-president of construction with Warner Amex Cable Communications, he was responsible for the building of cable TV systems in Dallas and Houston.

Christopher Singer has joined the Granada group as managing director of Granada Microcomputer Services which retails microcomputers through high-street business centres. The first outlet opened in Slough in April. Singer was formerly a director of Aregon International.

Hobman Hunt, managing director of PA Computers and Telecommunications (Pactel) has been reappointed to the Monopolies and Mergers Commission for a further three-year term. During his first term he served on such well-known references as the Central Electricity Generating Board, London House of Fraser and Anderson Strathclyde. He is currently investigating the Civil Aviation Authority. He is a computer professional of some 25 years' standing and founded PA's computer activities in the UK in 1958.

Steve Lord has been appointed associate sales director for Masstor Systems UK, joining Masstor after 16 years with IBM, where he served in a number of executive positions involved in technical developments and sales.

Law Data Systems, the Leeds-based computer software house which specialises in the development of debt collection systems and services for the legal profession, has appointed Mark Fletcher as marketing and sales director, and Andy Bamforth as technical director. Fletcher has been involved in the marketing of computer systems since 1976 and will continue to control the sales development and marketing operations of the company throughout the country. Bamforth joined Law Data Systems in 1978.



As part of its expansion programme following the merger with Molecular Computer, Multicomputer has announced the addition of four senior personnel. John West (left) formerly product manager for the CNC product range of Allen Bradley, has joined as operations manager responsible for all post-sales activities; Stuart Pole (second left) formerly with Honeywell's city branch, has joined as OEM sales manager; Rod Dimmock (right) previously with Nixdorf Computer, has joined as sales executive for OEM and distributor accounts; and David Cornwell (second right) formerly with Centre-File, has joined as sales executive, end-user sales.

DIARY

SEPTEMBER 29

Intel iAP432 specialist, High Integrity Systems, is to hold a one-day seminar at the Excelator Hotel, Heathrow. Further details from Carolynne Jones. Tel: 0279-725030.

OCTOBER 3-7

Management for Operations Staff is a Compower Training School course at Cannock, Staffs. Cost is £465 including accommodation and meals, but not VAT. Details from J. B. Dunning at the School. Tel: Cannock 2511.

OCTOBER 4

Man-Machine Interaction Programme is the theme of the British Computer Society Microcomputer Specialist Group first meeting of the 1983-84 session at Baden-Powell House, Keosington. 1.30pm. Cost £150. Details from Robin Phillips, secretary, 21 Rye Close, Salford, Brighton BN2 8PP.

OCTOBER 4-6

Programming Business Systems to Basic is an NCC course. London Training School. Cost is £365. More details from Course Administrator on 061-228 6333.

CONFERENCES

The fourth programme of Pergamon Infotech's Intensive Technology Development Series is to be presented during November and December. Nine events, covering each of the principal computing disciplines, and lasting from two to five days, are included. All are to be held in London and fees range from £280 to £460 + VAT. Further information from Pergamon-Infotech.

OCTOBER 10-11

Wang (UK) is holding four half-day seminars covering office automation and word processing. Fairfield Hall, Croydon. More details from Sara Perry on 01-621 1010, ext. 272.

OCTOBER 12

Seventh annual symposium on computer applications in medical care. BCS Medical Group, Baltimore Convention Centre, Baltimore, Maryland, US. Details from Dr Virginia Saba, Nurse Consultant, Division of Nursing, Bureau of Health Professions, 3700 East-West Highway, Room 3-50 Hyattsville, Maryland 20782.

OCTOBER 15, 17

Data Protection is a one-day course in London on November 15 and in Liverpool on November 17. Instructor, Joseph Kenny. Details from Keith London Associates, 07073-30114.

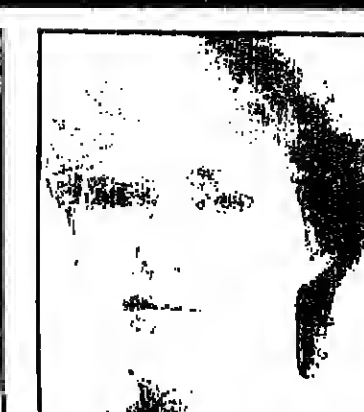
NOVEMBER 4, 5, 6

Brainwave, the consumer show for users of home computers, home video and home electronics. National Exhibition Centre, Birmingham. Details Clapp and Poljak on 01-747 3131.

What's New in Financial Modelling and Graphical Presentation is the theme of Sirius User Club's next seminar. It explores recent advances in software development that turn standard spreadsheet data into charts and graphic diagrams. The seminar takes place in London on October 3 and 4 and costs £30 a day. Full details from Sirius User Club, Enterprise House, Gordon Street, Luton, Beds. LU1 2QP.



Philippa Edmunds (left) and Anna McManus have joined Package Programs Ltd, the financial application package supplier. Edmunds, PPL's new administration manager, previously worked in Amstrad for Software International, and prior to that organised client training for Comshare in London. McManus, who has joined PPL as a marketing assistant, spent three years with IBM in the application and technical support groups.



Data General has appointed Philip A. Dowley as manager, Scotland. He has been with Data General for four years as a senior sales representative, based in Glasgow, and covering the North of Scotland. Prior to that, he spent four years with Rediff.

Computer Technology has appointed James Bowie as manager, Philip A. Dowley as manager, Scotland. He has been with Data General for four years as a senior sales representative, based in Glasgow, and covering the North of Scotland. Prior to that, he spent four years with Rediff.

Martin Lester has joined MRS Microtex as a software support consultant. Previously he was with Olympia Business Machines as a micro software consultant. He earlier held technical support positions with Surrey Typewriters and Philips Data Systems.

At Nashua, supplier of copper equipment and removable magnetic media for computer systems, Frank Skinner, formerly UK sales and marketing manager, has been appointed European general manager, with overall responsibility for European distributors, OEMs and developing new business opportunities, and Jim Stevenson assumes the role of UK sales distribution and marketing manager. Skinner joined Nashua in 1973 from IBM. Stevenson joined Nashua from Honeywell seven years ago.



New field sales manager at Digital Microsystems is electronics engineering graduate Eddie Wernick who will be responsible for both dealer liaison and the development of sales to large corporations, public utilities and educational establishments in the North of England and Scotland. Wernick joined Exel Engineering as an account executive in January 1980, and moved to DMS also part of the Exel Group, when it was formed in September 1982.

Albus Computer Systems announces the appointment of Alan Mawdsley as OEM sales manager responsible for spearheading a major OEM marketing drive into the OEM market, and large end-user accounts. He joins from Oceanic, where he was sales manager, responsible for the company's Scientific and Technical Division.

Alup Hotel Services, supplier of computer services to the hotel industry, has appointed Russell Kett as marketing manager. Kett was a consultant with Horwath & Horwath (UK) for six years, specialising in accounting control and management reporting systems.

Isn't it about time you stopped giving away all your best ideas?

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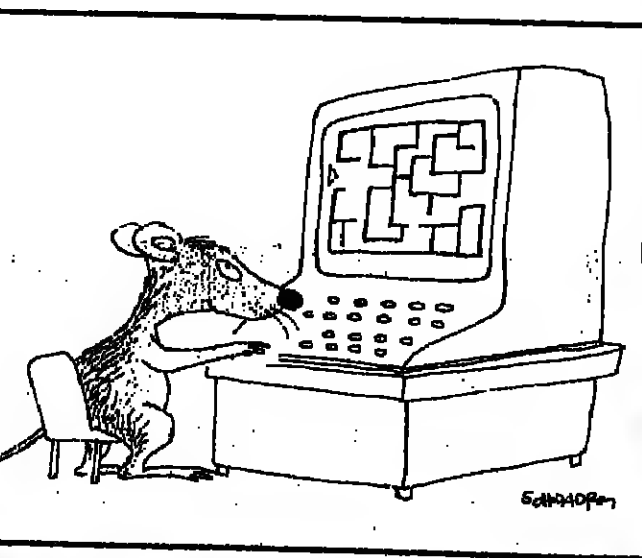


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ACCIDENTS... computers can pinpoint the black spots.

County cuts crashes

THIS campaign against road accidents is being boosted in one home county by a computer program that has identified the main causes of and trends revealed by 10,000 accidents. Hertfordshire County Council has built the biggest UK database covering road accidents, on a Prime minicomputer.

Every accident in the county during the past two years has been recorded, with each of 99 possible contributory factors, such as bad tyres or driving too close to the car in front. A program was written to prepare statistics for a report that has just been submitted to the county's highways subcommittee.

One purpose of the program is to locate accident black spots and pinpoint main contributory

hazards, such as poor streetlighting, concealed junctions, and traffic lanes converging.

The program has been used to evaluate the effect on accidents of small maintenance jobs, such as filling in pot holes. Team leader for accident prevention at the council, Tug Wilson, says that accidents have been reduced by 26%.

He adds that computer analysis has revealed that cutbacks on road maintenance, resulting from the drop in rate support grant from the government has taken its toll on the roads.

The program has revealed that bad tyres were a contributory factor to more than twice as many accidents in 1982 than in 1981.

Workplace is compiled by Philip Hunter

Let's be more realistic about Japan's fifth generation project...

Progress in creating a fifth generation computer is less advanced than some people imagine. Development of a suitable language lags behind and many hard choices have yet to be made, says Hedley Voysey

ENGINEERING developments reveal fundamental transitions in their history in an interesting way. Portable power is a great idea, but changes in popularity between jet engines, diesel engines and conventional petrol engines affect other streams of engineering developments. The ramifications ripple away to change the way crude oil is refined, as well as a host of transport design systems using portable power plants.

In computing developments, transitions have roots in physical materials and their processes. The limitations on speed for computers depend on the reaction time of circuits (not the simple speed of light limitations) and this pushes along the urge to increase the density of logic packed on a chip.

However, if power demands are too high, then there are sharp limits to this process. The search for low power designs then becomes the critical choice factor in the process of designing the hardware base for computing.

However, this physical base for computing engines is complemented by a powerful notational base. The way that the hardware designers look at more complex assemblies of processing elements is limited by the power of their descriptive tools, whether these are graphical languages, or languages closer to conventional programming formats.

There is also a need for notations and languages to support the implementation of procedures and specifications being executed on processors capable of working in parallel.

As the whole thrust of shifting the spread of artificial intelligence (AI) achievements into everyday practice depends on lavishing logical processing power on these methods, there is a hunger for

massively powerful parallel machines.

The reasoning behind the Japanese belief in the existence of a fifth generation of complete concepts in computing stemmed from their assessment that a sharp transition in the notational (or programming language) base was necessary.

Their idea was to mesh the developments in hardware and software, so that they kept in step with each other.

If this reasoning is correct, then the choices being made in the programming language field by the Japanese may be crucial to their success in maintaining the coherence of their plan.

The original span of 10 years to make the major transition to a new generation has now been subdivided into three phases — the first runs for three years and the second for four years — leaving three years to put the act together.

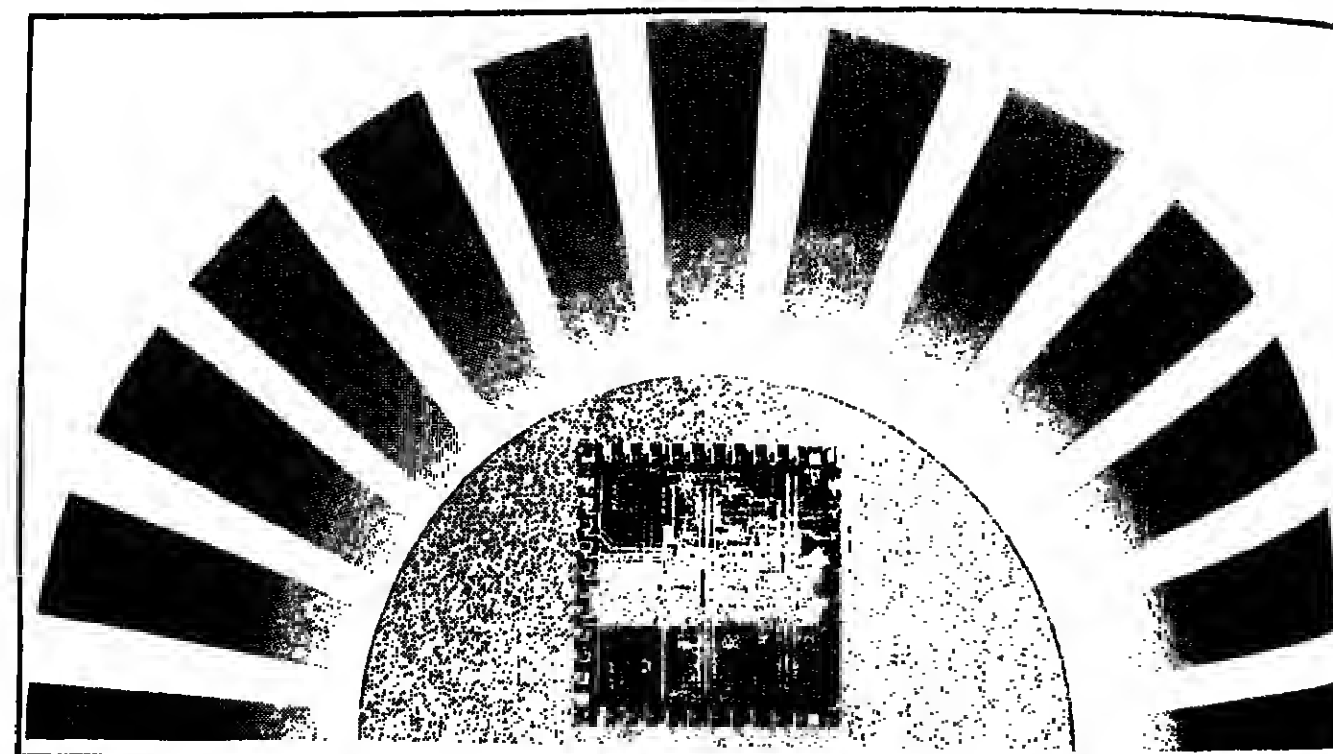
Although the view of the Institute for New Generation for Computer Technology (ICOT) are of-ten taken to be the sole view of the Japanese when making critical choices in computer architectures, the truth is more subtle.

Nevertheless, it is ICOT which has set out its plan clearly, so it acts as a yardstick for other groups, both in Japan and in the rest of the world, to choose to measure themselves against.

ICOT has established eight sectors of work, which range all the way from studies of "inference functions" down to designing in very large scale integration (VLSI), using artificial intelligence techniques.

A powerful case for the coherence of the Japanese set of choices as made by ICOT was put forward recently by Shinichi Uchida.

The actual construction of test



beds of the selected couple of computer architectures does not start until the 1985/86 period. Therefore, the evaluation of performance and feasibility made then will be a time when the project will either gather pace or be subject to some critical reassessment.

The two basic mechanisms to be tried out are an inference mechanism and a knowledge base mechanism. The putting together of these two to form the prototype of the fifth generation computer is not planned to be done until the final phase of the project, which is due to start in 1989.

The Japanese choice for the kernel programming language has been "logic" programming, based on the Horn clause version of predicate calculus. The strong link, due to the underlying use of predicate calculus, between this style of specifying actions and the relational database view of knowledge is the twine which binds the two streams of studies in

The choices being made in the programming language field by the Japanese may be crucial to their success

Japan together so that knowledge base development does not stray away from the inference mechanism.

As the Prolog language already exists to support logic programming, the Japanese regard this as a starting point. An entire group of the ICOT staff of about 40 people, however, is devoted to kernel language developments. They are aware that developments in logic programming are absolutely essential — especially for some problems in artificial intelligence.

The key point to emerge from Uchida's presentation (which apparently surprised some US delegates to the Stockholm meeting on VLSI, where it was given in June) was that very little is fixed in the Japanese plan for the fifth generation.

The machine design studies range across dataflow machines, as pioneered at the Massachusetts Institute of Technology, to reduction machines, as pioneered by the West Germans.

Uchida is blunt in expressing the view that the language developments are well behind what is

needed to develop hard and fast architectures for a fully parallel inferring machine in the later 1980s.

As the researchers have to work on something, they are getting a fairly primitive sounding Personal Sequential Inference (PSI) computer.

The PSI is a 40-bit machine, which may be thought of as a 32-bit engine with the addition of an eight-bit tag. The memory size is to range from four to 16 million words of 40 bits, and it should run Prolog about as fast as some of the existing machines in universities.

One of the priorities is to get a faster version of Prolog up and running. The raw speed of this PSI cannot be very great, as the micro instruction cycle is not much less than 200 nanoseconds, with a mere 64 bits of width for each micro order.

Although the Japanese are as interested as everyone else in trying for some extra power by developing "extremely long instructions" for microcode, there are no plans as yet to boost the PSI that way.

One of the more immediate tasks is to extend Prolog to enable it to be used for systems programming. The studies to find a fully parallel language are much more long term, as is the parallel version of the inferring computer.

All the detail given by Uchida on studies on designing a fully parallel inferring machine indicates that most of the large or hard choices are a long way from being made yet.

That is hardly surprising, but it adds a dash of reality to some of the wilder sorts of story being touted about the Japanese work at ICOT and the eight manufacturers tied into the fifth generation project.

Work at the Musashino Laboratory of Nippon Telegraph and Telephone (NTT) shows how much the Japanese are hedging their bets about "languages of the future". These NTT researchers use a simple Lisp based machine (comparable to the US original Lisp machine), which uses a 32-bit machine, although eight-bits are again absorbed for tags.

The NTT workers believe that Prolog does not provide a suitable style of expression for every situation. Their approach is to allow types of variable in the "two language", so that users can choose to

be compatible with either Lisp or Prolog.

They have also turned towards object-oriented programming, represented by languages such as Small-Talk, by allowing message passing, plus some interesting ways of classifying messages.

What the NTT researchers have spotted is the same sore point that Uchida stressed. We need to evolve programming description tools (both the languages as a set of features and as a reflection of the underlying model for computation) to suit both the experience of programmers and the variety of problems they are required to solve.

Oddly enough, the Japanese way of approaching things is closer to the UK way of developing this line of research than is commonly supposed.

Phil Treleven of Newcastle University presented a paper at the Stockholm meeting on the choices to be made in building highly

Phil Treleven stressed the need to keep one foot in the past experience of computing, while searching for a toe-hold in more highly parallel ways of describing programs

parallel machines. He said that the Japanese emphasised the discontinuity between current styles of computing and the fifth generation aims in computing, based on logic programming.

However, the evidence is gradually beginning to pile up from Japanese papers that most of the critical choices still have to be made. The NTT's work alone shows that distinguished groups of Japanese computer technologists are in no hurry to be herded into a prison formed by the constraints of current versions of Logic as a programming language.

Furthermore, they are prepared to adapt existing beloved tools, such as Lisp, to make them even more amenable to programmers familiar with conventional control flow programming languages.

Treleven stressed the need to keep one foot in the past experience of computing while searching for a toe-hold in more highly parallel ways of describing programs. The Japanese seem to be stressing the urgency of exploring the parallel world of computing, but footnotes to their re-

search show that they, too, are aware of the need to consider success in design.

The same evolutionary line of the Japanese emerged at a workshop at Eindhoven University covering developments in low power consuming VLSI which basically concerned complementary metal oxide semiconductor (CMOS) progress.

As Professor Jonathan Allen of the Massachusetts Institute of Technology said: "The market for million transistors chips will last quite a while. It is the best work being done in CMOS."

The Japanese representatives from Toshiba and Nippon Ham co-ordinated. Both the US and the Japanese were impressed by achievements presented by

To everyone's surprise, the paucity of the UK's contribution to the venture in exploiting CMOS build up to 5,000 gates per

chip. The aim here is a turnaround.

The fabrication is being done by British Telecom and there are other major organisations, including the Science and Engineering Research Council, involved.

After about 18 months, the chips are being evaluated as targets of achieving a design in a week or two of actual time. Gate arrays are so far the leading edge of technology. Japanese were expected to be forced by hearing that their reaction was that the achievement enabled designs to evolve beyond simulation and this was a significant.

They were naturally interested in the latest microchip processor — the AT 80186, which is aimed at enabling practical parallelism to be explored in multiple processors ganged together.

The Japanese thought the "quite outstanding" benefit to help to evolution.

Leader of the pack... the new Qume QVT range of video terminals from BYTECH



Available now from Bytech, the major distributor of QUME printers is the now low cost ergonomically designed QUME QVT series of video terminals.

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QUME QVT terminals all share striking ergonomic design. Tilt/swivel screens in green or amber, with screen save. Detached, low profile keyboards with palm rest and sculptured keys. Dig 9 x 12 character cells. And a long list of other features to make people more comfortable and productive.

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... they're hedging their bets

DATA STORAGE

Stick by what you know works...

... because keeping pace with technology is not for the faint-hearted, reports Keith Holder

THE demand for storage peripherals continues to grow, according to one report from Freeman Associates, which predicts a growth rate of 23% over the period 1982-87.

Keeping pace with this demand in terms of technological improvements is not for the faint-hearted, particularly as recent developments with both floppy disks and optical storage systems threaten to change the face of the storage market. As with any fiercely fought technology battle the race to get a system into production is conducted at breakneck speed and often leads to a state of similar "breakthroughs" hitting the marketplace simultaneously.

Yet for all the advances there still remains a market for older technologies and systems which, if nothing else, represent a known quantity for performance.

Oldest by far is the magnetic tape which, though superseded in performance, remains popular with a lot of users. IBM found this out to its cost when it launched an all-data-online campaign to motivate users to change to disc storage.

The campaign was a dismal failure attributed to the huge investment many users have in tapes and their satisfaction with tape performance. Another cause was the failure of IBM and plug compatible rivals to deliver mass storage disc systems such as the 3380 on time.

Improvements in tape capacity and reliability have also been impressive, reaching a maximum density of 6,250 bits an inch and speeds of 200 in a second. Improved production techniques have also yielded lower error and loss rates through better control of oxide particle voids and tape distortion.

Tape drives have improved too, with better servo mechanisms and error detection systems. Progress has also been made in reducing head wear caused by the higher tension needed for high density tapes. For extreme environmental applications, Wabash DataTech has developed a tape which will operate virtually error free in extremes of heat and cold.

A compromise between tape and disc systems comes in the form of the IBM 3350 and Masstor M860 mass storage subsystems. IBM has a six year head start over the competition, though sales of this system have been disappointing. Frost and Sullivan put the European total at no more than 750, though Masstor's offering is said to be making better progress. These devices are designed to re-

duce the time for retrieving information from very large tape systems and consist of "boxes" of several hundred cartridges, each with a 70ft long strip of tape coiled inside which is accessed by a central arm or trolley.

The floppy disc is, and will probably remain, the fastest growing area of storage technology but, partly because of this, users are now faced with a bewildering choice of different sizes, capacities and so-called standards. The capacity offered by these devices has risen sharply. Drivotec's 320 "supermini-floppy" already offers 3.3 Mbytes on a 5 1/4 inch disc and Amlyco plans to release a 6.4 Mbyte 5 1/4 inch drive by the end of the year.

Progress has taken two forms, firstly with improvements to the disc media itself resulting in higher track densities (196 tracks per inch) and storage capacity.

Secondly, in order to make use of these disc developments, drives have undergone several refinements to allow better track following, taking into account environmental changes in the disc material, and positive centring of the discs.

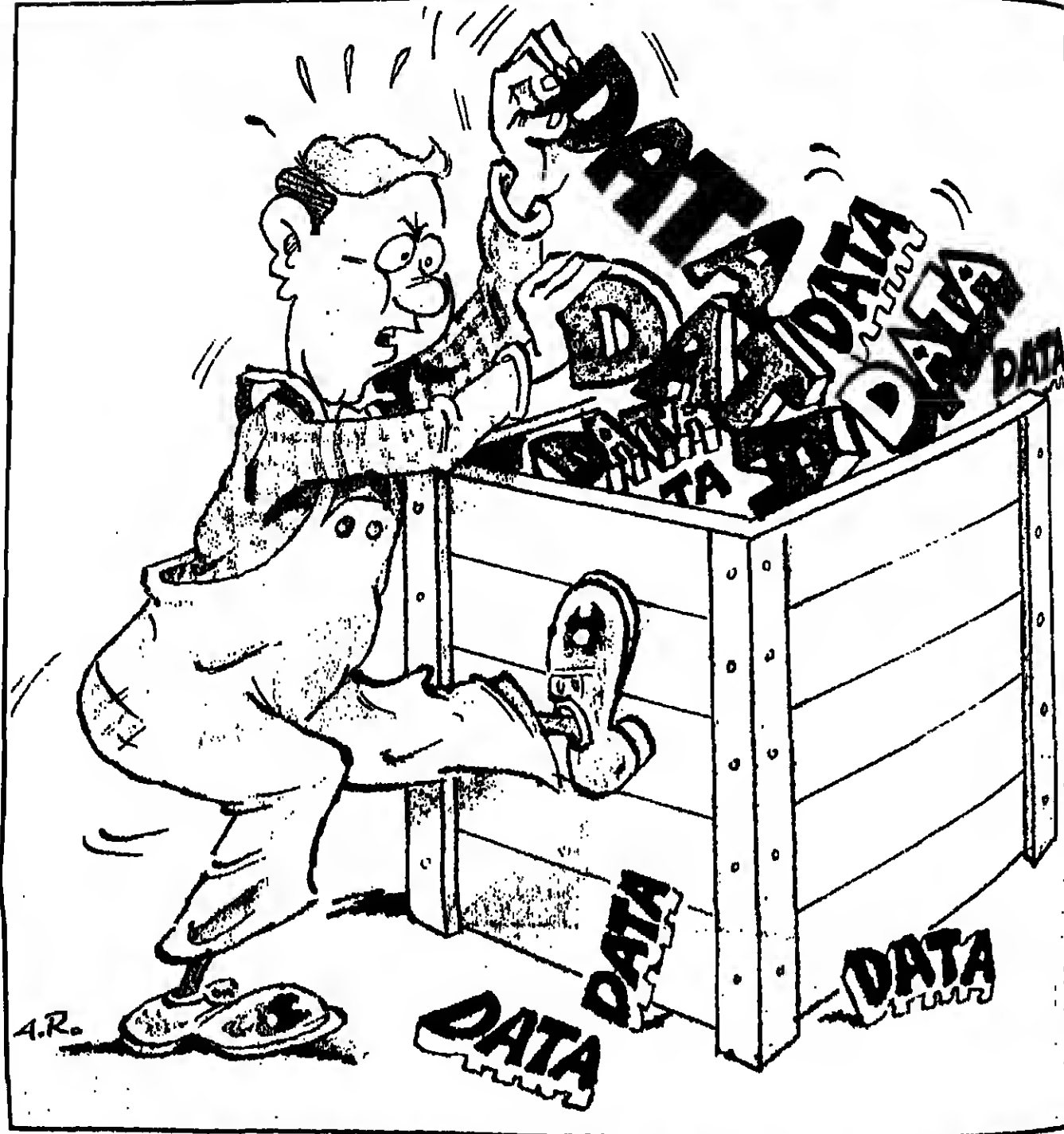
The high density discs, currently available from a number of manufacturers, including BASF, Dysco, Memorex and 3M, use iron oxide particles impregnated with cobalt in coating thicknesses around one micron to achieve the necessary performance.

But however good these discs are they will always distort under the effects of temperature and humidity and the success of these systems is largely due to manufacturers' efforts to develop tracking systems which allow the read/write head to compensate.

This type of closed loop drive has been achieved in a number of ways though the basic method is similar in all cases. The servo receives information from a reference track located outside the data storage tracks which continually updates the positioning of the head.

Drivotec's system, for example, does this by comparing two signals from adjacent tracks and, via a microprocessor, alters the positioning of the head until the signals are equal. The benefits gained by this are twofold: not only does the head give an error-free read throughout the disc surface but the reliability achieved when changing from one disc to another is also improved.

Read/write head geometries have also come in for attention to eliminate excessive head wear and



improve contact between disc and head. The addition of hub reinforcement rings and refinements to clamping devices in drives has led to better control over disc centring.

Aside from the purely technical considerations there has been a growth in the number of disc sizes. Eight and 5 1/4 inch discs are still the most popular, but the last three years have seen a growth in the three, 3 1/2 and 3 3/4 inch camps. The performance of these smaller drives is comparable with their larger counterparts.

Tabor, for example, has a 3 1/4 inch device which holds 500 Kbytes using 140 track per inch. A three inch drive is available from Hitachi, Hitachi Maxell and Mot-

The consensus is that great things are afoot but it may be worth sticking with what you know will work today

tsushita which uses a hard shell disc. In the battle for standards on the sub 5 1/4 inch market many companies are looking to IBM to provide a lead and some are keeping their options open until IBM makes its move, as the plug-compatible market will certainly provide huge potential sales.

While many of the manufacturers have made their sub 5 1/4 inch offerings compatible with the larger drives the IBM 3 1/2 inch drive is not.

Development of eight inch drives by comparison has been virtually non-existent.

The sole exception to this is the Omega Alpha-10 which uses a special track medium to allow about 200 tracks an inch, en-

abled servo positioning and rotational speed five times that of other eight inch drives to achieve a 10 Mbyte storage capacity.

In terms of disc devices at the very high capacity end of the market nothing has yet appeared to match the IBM 3380's 2,500Mbytes. Though this device took a long time to appear and was subject to a plethora of delays and production hiccups, when it did finally get into service users commented very favourably on its performance and reliability.

The market has been alive with rumours from rival manufacturers about plug-compatible lookalikes ever since. Despite all this activity only one manufacturer has so far ventured a device which will enu-

merate the Japanese company Matsushita has already announced an erasable disc and Hitachi, working with Hitachi Maxell, has announced a range of discs and controllers capable of storing 1,310Mbytes on a single side of one disc. Those eager to try this technology will still have about six months to wait for deliveries for Hitachi.

The pressure to develop these systems in Japan has come from the desire to improve document handling and library filing using their 4,000 character Kanji alphabet. This would be an ideal application for this technology as images and diagrams are easily stored.

Although the Japanese appear to have a temporary lead in this technology, they are not likely to keep it long. Philips, in partnership with Control Data, has a similar system at the customer trials stage and spokesmen for these companies say that they are confident of a launch date early in 1984. The

Philips disc is said to be capable of storing around 200Mbytes in disc.

3M and NEC both plan to launch systems ready for delivery in 1984 and a partnership between Xerox and the French company Thomson CSF is said to be advanced.

Although these devices are being launched initially as plug-compatible lookalikes, they are not intended to replace the current range of disc storage devices. Erasable discs are already developed and around 10 major manufacturers are at an advanced stage with prototypes and customer trials well in hand.

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DATA STORAGE

Why secondary storage costs are increasing in significance

But, as Owen Hanson writes, the choice is not a simple one and is not becoming any easier

AS THE cost of main storage and of CPUs moves relentlessly down, the relative cost of secondary storage — discs, tapes and mass storage devices — grows even more significant. For discs, we are constantly told that the cost of storage per byte is far lower than it used to be.

This is true, but it is still catching up the cost of mainframes, and in applications such as banking and insurance it has already become the largest part of hardware costs. For example, a 236 gigabyte 3850 costs more than a 3083 CPU with 16 Mbytes of main storage. At a lower level, a 4331 L2 CPU, with four Mbytes of main storage, costs less than a string of four 3775s with a disc controller.

More than three years ago, IBM launched its all-data-online campaign to move users from tape to disc storage. The campaign was not successful, partly because of the huge investment many users have in tapes; the satisfactory performance of those tapes and their users' intention to go on buying and using tapes.

The campaign also failed because IBM and its competitors did not deliver 3380s and their look-alikes on time. Now these delivery problems have been overcome, users could switch entirely to direct access storage, but, this would not generally be cost-effective, as most installations still have a lot of sequential files in use for which tape storage is highly satisfactory. Recent surveys by Rekha Patel and S. M. Woo of the City University showed that between 80 and 90% of users have sequential files in operation at the present time.

One user has been able to keep both hard and soft errors on tape down to a maximum of one hard and three soft errors in three months. Given this level of performance, it cannot be said that tapes are unreliable, although not every user can compete with this success rate. To do so, it is necessary to log every error on a tape, and use tape certifier and tester devices to ensure that tapes are operating correctly and to identify lengths of tape that are causing problems. But, with this level of

care, there should be no problems with tapes.

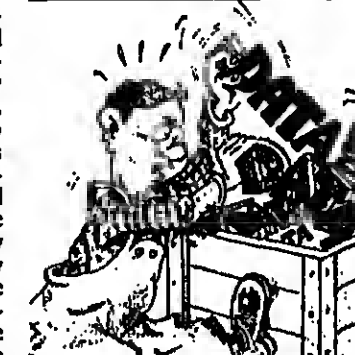
Despite the virtues of tapes for high hit-rate sequential files, the main problems users experience with direct access devices are inherent in the devices.

Large numbers of hard discs are available for microcomputer systems, but they are not well suited to business needs.

Backup provision often relies entirely on floppy discs, with 10-30 such discs needed to copy the whole of the hard disc for security purposes.

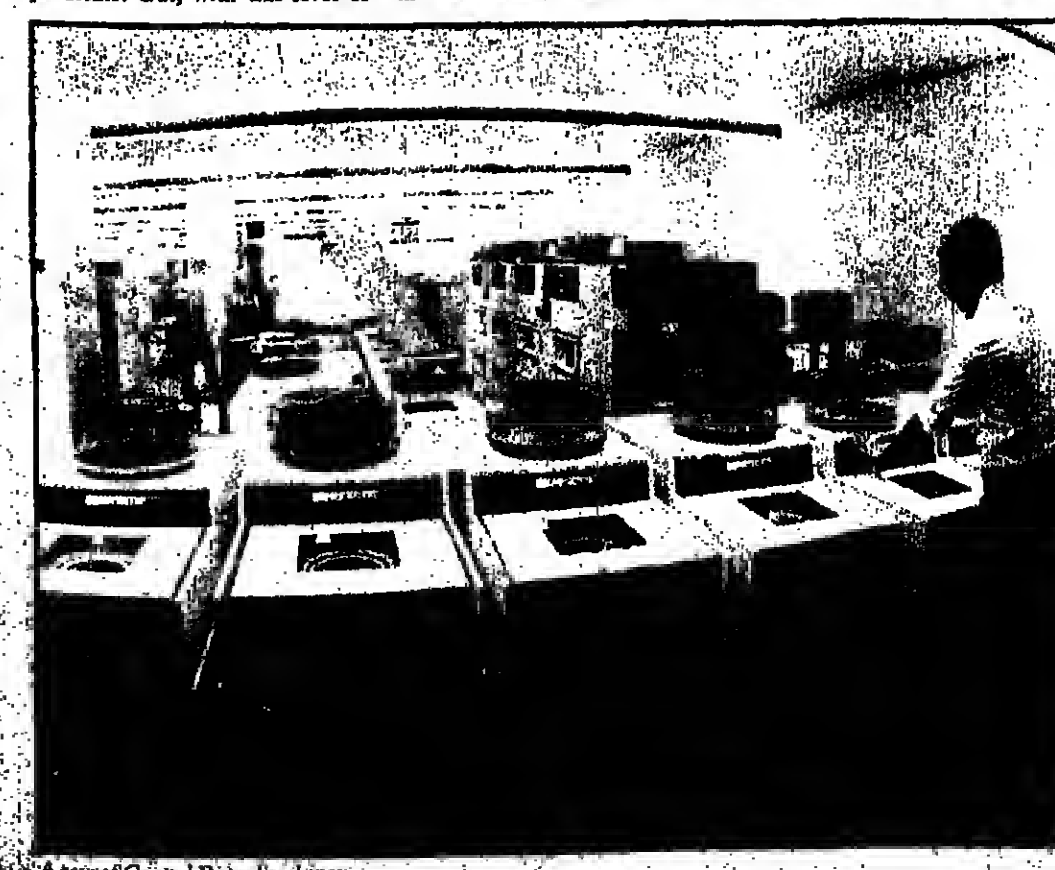
Many systems rely on cartridge tapes, which are relatively slow and far less reliable than the device they are backing up (as are the floppies).

Only a few units offer the option of a removable disc to back up the fixed part of the unit. The best known of these are CDC's 9454/9455 Lark, an eight inch unit with an unformatted capacity of 8 + 8 Mbytes; DMA System's Mjoro-Magnum, which is a 5.25in., 6.75 Mbyte unit; and the



How many users have bought the big new discs, believing that their problems would be solved only to find they were not

New World Computer 5.25in. unit of four Mbyte + a two or four Mbyte removable cartridge. Eventually, of course, all hard disc manufacturers will be driven in this direction, and many users feel that the sooner the better.



A row of Control Data disc drives.

Device	2311	2314	3330-1	3330-11	3350	3380
Date	1964	1967	1970	1973	1977	1981
Capacity (MByte)	7	28	100	200	317.5	630
Transfer rate (BPS)	156K	312K	806K	806K	1.2M	3M
Average access time (ms) (including head movement and rotational delay)	87.5	72.5	38.3	38.3	33.3	24.3

Table 1: Access time of discs

Device	STC 4305	Intel Fast 3805
Access time (ms)	0.3	0.4
Capacity	15-50	11-22
Transfer rate (BPS)	1 M, 1.5 M or 3.0 M	1.5 to 4 M
Compatibility	2305	2305, 3350

Table 2: Semiconductor access time

Device	Braegre 7110	IBM 3850	GDC 18500	Masstor M860
Capacity	808 to 7808	35,000Mbyte	16,000Mbyte	55,000Mbyte
Range	reels	472,000Mbyte min	1,000,000Mbyte min	440,000Mbyte min
	144,360Mbyte max	472,000Mbyte max	1,000,000Mbyte max	440,000Mbyte max
Data access time (seconds)	15-20 to mount only	8-13 range	7.5 average	7.4 average

Table 3: Motive storage devices

There has been a very great increase in capacity per access head, and in data transfer rate, over the last decade. This has not been matched by the modest improvements in average access time achieved over the same period. Table 1 gives typical values for these three essential measures of disc performance.

Since the advent of the 2311 in 1964, the value of data swept by a single access head has increased 90 times and data transfer rate has improved almost 20 times. By comparison, the average access time (for a full disc) has only been reduced 3 1/2 times, and even since the advent of the 3330 it has only come down from 38.3 to 24.3 milliseconds.

The comparison is not altogether fair, however, because if file sizes had stayed the same a far higher proportion of a file would

be under the access heads at one time than in the past. But file sizes have increased, so the figures show a serious weakness. And, because of the advent of virtual storage systems, page datasets, which are much smaller than the capacity of modern devices, are so active that all other datasets on the same huge volume are virtually unusable.

It is fashionable to say that the speed of modern equipment is so great that there is no need to be careful with data file or system design. For disc files that have never been less true. Huge capacities inevitably lead to head contention, as most users know to their cost. How many users have bought the big new discs, believing that their problems would be solved, only to find they were not? If the manufacturers knew, they are not saying.

A better method of disc design would have been to increase enormously the number of channels and access mechanisms, keeping the capacity of data storage swept by a single access mechanism to a minimum. Manufacturers went the wrong way, but all is not lost, because of the advent of disc cache and semiconductor disc storage.

Semiconductor disc storage, with an access time seven times that of fixed-head discs, and about 100 times that of the 3380, first appeared in 1978/9. Table 2 shows figures for the STC 4305 and the Intel Fast 3805 storage devices.

These devices can be used either to handle operating systems and page datasets files, or for longer file storage as front-end processors. Although they are not being used by many companies, those users who have them seem very satisfied with their reliability and performance and point to marked improvements in performance.

The second alternative is disc cache storage, aimed at front-ending a disc string. IBM offer the 3880.11 disc control unit, with eight Mbytes of semiconductor storage that can be used with 3350s to handle paging data, and the 3880.13, which can have four or eight Mbytes of cache storage to handle application file data on 3380s.

Although there is a small benefit for direct applications, the greatest



Inside the 3850 mass storage system.

benefit for the 3880.13 is in handling sequentially accessed files, as a large part of the file can be transferred to cache and processed in its entirety before being returned to disc.

Where there is a genuine need for massive direct storage, a number of devices are available (see Table 3). These devices do not compete with discs in speed, but they are much more useful in, for example, insurance or banking, to store records that are seldom accessed, but must be available to answer the occasional query.

Given the present choice of data file storage devices, there is no easy way to handle every situation. For backup or high hit-rate sequential files, tape is still worth considering. For massive direct access storage, a mass storage device is unavoidable.

In between, the need for change may be due to a lack of separate data paths when many files are active at one time; the need for very fast response when data is being rapidly paged in and out; or the need for very rapid transfer rate when skip-sequential processing of files is possible.

The choice is not a simple one, and it has not been made easier by the direction recent disc design decisions have gone.

STC offers a more complex arrangement with its 3390 Syber-cache. Typically, it provides multiple paths in the data and allows the user to choose between using cache for sequential access only, for all access, or for none. STC claims that sequential access time can be reduced by 40-75%, and direct access time by up to 35%.

As manufacturers of discs have made the mistake of providing

very large, non-removable disc volumes to their customers, semiconductor cache as a front-end to disc strings will become more and more common. But this trend should be reversed. It is not true that backups can be organised fully satisfactorily without removable discs or tapes.

Where there is a genuine need for massive direct storage, a number of devices are available (see Table 3). These devices do not compete with discs in speed, but they are much more useful in, for example, insurance or banking, to store records that are seldom accessed, but must be available to answer the occasional query.

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The choice is not a simple one, and it has not been made easier by the direction recent disc design decisions have gone.

Owen Hanson is director of the Centre for Business Systems Analysis, the City University, London.

More and more people are finding their way into storage

John Aczel finds that UK production of storage units is growing and sales are increasing

	Jan- June 1983	Jan- June 1982
Belgium-Luxembourg	1,965	839
Canada	741	448
Denmark	1,536	1,246
France	4,061	1,258
Germany (West)	29,517	11,681
Ireland	1,397	807
Italy	2,147	1,563
Japan	10,318	2,266
Netherlands	4,743	4,927
Portugal	4,445	3,446
South Africa	170	253
Sweden	468	169
Switzerland	227	N/A
US	57,651	44,641

Table 1 - British imports of disc storage units by main suppliers (by value)

	Jan- June 1983	Jan- June 1982
Belgium-Luxembourg	911	464
Canada	219	147
Denmark	80	20
France	698	1,094
Germany (West)	57	21
Italy	658	-
Japan	560	495
Netherlands	43	33
Norway	75	11
South Africa	2,014	2,165
Spain	307	866
Taiwan	16,536	10,652
US	-	-

Table 2 - British imports of magnetic tape storage units by main suppliers (by value)

	Jan- June 1983	Jan- June 1982
Belgium-Luxembourg	446	498
Canada	503	372
Denmark	162	109
France	3,108	2,427
Germany (West)	17,511	6,403
Ireland	3,019	1,258
Italy	3,298	2,166
Japan	93,216	10,502
Netherlands	11,862	11,882
Portugal	1,318	1,230
South Africa	78	143
Sweden	475	382
Switzerland	77	-
US	96,263	41,485

Table 3 - British imports of magnetic disc storage units by main suppliers (by number)

	Jan- June 1983	Jan- June 1982
Belgium-Luxembourg	1,196	169
Canada	16	4
Denmark	39	62
France	16,122	6,236
Germany (West)	17,511	6,403
Ireland	3,019	1,258
Italy	3,298	2,166
Japan	21,559	3
Netherlands	2,251	232
Norway	155	135
South Africa	10	4
Spain	316	353
Sweden	23,000	44,850
Taiwan	20,019	4,377
US	-	-

Table 4 - British imports of magnetic tape storage units by main suppliers (by number)

	Jan- June 1983	Jan- June 1982
Australia	82	74
Belgium-Luxembourg	1,062	450
Canada	55	126
France	6,166	4,429
Germany (West)	9,614	6,922
Ireland	3,430	1,055
Italy	5,479	4,137
Japan	646	409
Netherlands	1,773	594
Sweden	1,341	613
Switzerland	1,059	715
US	7,791	2,462

Table 5 - British imports of disc storage units by main suppliers (by value)

SALES of storage units in Britain have continued to grow rapidly and demand has gone up faster than expected. Imports have been buoyant and have captured a bigger share of the overall market.

Up-to-date information about the level of demand for storage units is not easily available and there are big gaps in the official statistics. But it is possible to estimate the size of the market by collecting various statistics, particularly those on imports, exports and production.

There are two main sectors of the market - disc storage and magnetic tape equipment - but the former is the more important. For both products, the market in 1982 was between £200 and £250 million at manufacturers' prices. This estimate is subject to revision as more information becomes available, and it does not include distribution costs or wholesale and retail margins.

According to some analysts, the value of the storage unit market is rising by about 40 to 50% a year, as a result of the rise in demand for various types of computer, especially micros.

Most of Britain's requirements for storage equipment are satisfied by imports but there has been a steady increase in production in the UK. Official figures show that production of storage equipment rose to about £75 million in 1982, against £70 million in 1981. For the first quarter of 1983 the figure was £20 million, continuing the upward trend.

During 1983, UK production should continue to rise and the full year figure could be 10% higher than in 1982, at about £80 to £85 million, with most of this being disc storage units.

Much of this output is being exported, with sales abroad amounting to nearly £60 million in 1982. Some of this may represent re-exported products, mainly from the US, but, if these figures are correct, they suggest that 80% of the UK throughput is now being sold abroad.

Home production is insufficient to meet the requirements of the fast expanding British market, so imports have been capturing a bigger share, and for some products, this was about 90% of total sales.

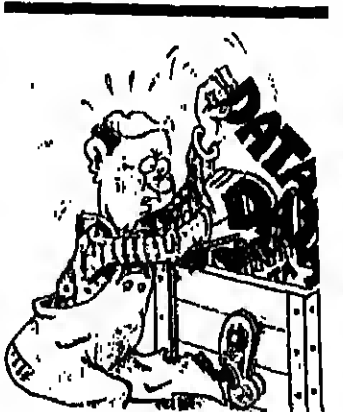
Competition in the computer storage market has been tough and

prices have been coming down rapidly. In the first half of 1983, the average price of an imported disc storage unit dropped to around £500, as against £1,000 a year earlier. Magnetic tapes have also been dropping in price - at about 20% a year.

These prices are port-of-entry prices. The price to the user includes retail and wholesale margins, and distribution costs. Nevertheless, the trend has been sharply downward, even though sterling has been weak against many other currencies. Foreign suppliers have been willing to drop their prices in sterling terms to secure higher volumes for their products, even though that has meant lower margins after taking into account currency fluctuations.

British imports of disc storage units went up to £121 million in the first half of 1983 - a rise of 60% over the same period of 1982. For 1983 as a whole, it is expected that deliveries will be worth about £250 million, as against £160 million in 1982.

The rise in imports by volume



UK production should continue to rise and the full 1983 figure could be 10% higher than 1982

has been even sharper and, for some products, it has trebled in real terms. Thus, 240,000 disc storage units came into the UK during the first half of 1983 as against 167,000 units for the whole of 1982.

This sector has been dominated

by US producers and sales by the US doubled to 96,000 units during the first half of 1983. This represented 40% of all deliveries into the British market, but a strong challenge has been coming from Japanese suppliers.

Sales by Japan increased fivefold to over £10 million in volume they rose tenfold to over 90,000 units. Japanese products were at the cheaper end of the market, especially their microcomputers, but competition has been heating up in all areas.

Continental sales of disc storage units have remained at a fairly low level, though the Netherlands, Germany and Switzerland have been active in the British market. Deliveries by West Germany rose in volume to over 17,000 units, while those from Switzerland went up to nearly 5,000 units.

The imports of magnetic tapes has also gone up rapidly, though the volume of these imports has been considerably smaller than for disc storage equipment. Imports of magnetic tape products reached £23 million in the first half of 1983, which was 43% more than in the same period of 1982. For 1983 as a whole, it is estimated that imports will be in the region of £45 million.

By volume, 100,000 magnetic tape units came into the UK in the first half of 1983 - almost double the figure for the same period in 1982. The average price of these units has gone down markedly to about £220 a unit, as against around £300 a year earlier.

In terms of volume, Japan and the US were neck and neck, with imports of around 20,000 units from each in the first half of 1983. By value, however, US suppliers were well ahead, with over 70% of the total.

In addition, very cheap magnetic storage tape units have come from Taiwan in great quantities, amounting to over 200,000 units in the first half of 1983.

Exports of storage units have been rising, though at a slower rate than imports. Disc storage units exports went up to £42 million in the first half of 1983 - a rise of 70% over the first half of 1982. It is estimated that for 1983 as a whole the total will be about £90 million.

In volume, exports of disc sto-

rage equipment have been rising faster - they may have nearly trebled in volume. Nearly 38,000 units were sold abroad, at prices drastically cut because of strong competition.

The top markets for British disc storage units have been some of the countries on the continent, particularly those in the Common Market. UK deliveries to France reached £6.2 million in the first six months of 1983, which was up by 40%, while those to West Germany went up by a similar percentage to £9.6 million. A significant trade has been developing with some of the smaller European countries, including the Netherlands, Switzerland and the Scandinavian countries.

British exports to the US have been making good progress and have benefited from the strength of the dollar. Sales to the US more than trebled in value to £7.8 million. During the first half of 1983, over 11,000 units were sold abroad.

For magnetic tape units, sales abroad have been small. Their



Foreign suppliers have been willing to drop their prices in sterling terms to secure higher volumes

value was only £3.7 million in the first six months of 1983, compared with £1.9 million in the corresponding period in 1982. By volume, about 2,200 magnetic tape units were sold abroad, the major markets being in France, the Netherlands, Spain and the US.



Manufacturers have got new technology taped

Derick Bostock reveals that tape technology has evolved to a very high level

INCREASING tape speeds and recording density require a tape with very good performance qualities, so that vital information is not lost due to oxide particle voids, tape distortion, etc.

Half-inch tape has been around since the beginning of the computer revolution and has had to keep pace with the new demands on its performance - for tape drives of many different designs, servo mechanisms, error detection systems, etc.

Tape is used for data storage, archiving, continuous processing, streamer back-up for disc systems and for the marketing of software. In all these applications, the basic requirements are the same - a mechanically stable and long-lasting base and consistent, error-free electrical performance.

Several recording techniques are used in tape transport systems, giving various storage densities. The non-return to zero (NRZ) format was used on early transports and is still popular, giving densities of 200, 556 and 800 bits/in and using nine tracks to read and write eight-bit data words, plus one parity bit.

Tape speeds of up to 75 in/sec are possible with this method but not higher because it cannot com-

pensate for tape speed variations. Self-clocking methods were introduced to overcome drive inconsistencies, relying on the change of flux polarity in order to identify level 0 or 1.

Each of the nine tracks on this phase encoded (PE) type of recording allows track clock signal recording, plus the data, and a flux change rate of 3,200 in allows 1,600 bits/in recording density.

The highest now generally available is 6,250 bits/in, with the group encoding recording (GER) method, which uses a similar technique to NRZ, except that data is written in a format that guarantees a flux change in every three-bit cell.

Tape speeds of up to 200 in/sec are now used in some tape systems. This, combined with high track densities, makes it essential to specify a tape that will withstand the mechanical stresses of repeated stopping and starting and maintain a faultless performance. In addition, at these higher speeds friction between the tape and the brass components becomes significant, although a certain degree of friction is necessary between the tape and the rubber components and between the oxide and backing surfaces to ensure smooth tape

handling and cinch-free fast wind. Therefore, friction against brass is quoted as a maximum figure, while friction against rubber and the tape backing is quoted as a minimum.

Tape technology has evolved to a point where magnetic tape is available to meet these very tight specifications and provide long-term reliability and consistency even under extreme environmental conditions. To meet all needs a tape manufacturer must have full

control of production, from buying the raw materials to testing the final product.

To this end, some companies make all their media in-house, instead of buying in the coated rolls. This allows all stages of production, from the manufacture of the base and its oxide coating to the final testing and certification to be watched closely.

This expertise has led Washburn to produce its Quadronix computer tape, for tape drives up to 6,250 bits/in. (The name derives from

the four-way test procedure used. Each reel is tested individually to ensure data integrity at two signal thresholds for consistent quality on all tape drives. The tape is constructed from an oriented polyethylene terephthalate (polyester) base of 0.00142 in nominal thickness, with a 0.0003 in magnetic coating.

Specifications for curvature, cupping, yield force, surface resistance, etc., are quoted for five years under normal working conditions.

The greatest demands are made on computer tape when it is used in extreme environmental conditions.

For example, as a result of a request from its customers, Washburn has developed a tape for geophysical exploration computer systems, which are used throughout the world in extremes of heat and cold.

Data integrity and security is paramount, but expensive exploration programs cannot be re-run if information is lost due to tape error. In this situation, the tape must be totally reliable when used with all kinds of tape drive and remain intact in physical conditions ranging from below zero to desert temperatures.

In addition, where marine oceanographic work is undertaken, the tape must withstand corrosive salt-water atmospheres. The large amounts of highly valuable data must be reliably stored.

New developments in tape technology meet requirements for high densities and high tape speeds -

200 in/sec or more. High speeds create problems of abrasive wear, due to the higher tape tensions required to maintain sufficient tape head contact. Higher speeds increase head wear, which is expensive in terms of increased maintenance and downtime. To combat this manufacturers have developed a new coating formulation for high-speed drives.

One type uses an oxide formulation, which is inherently smoother and cleaner than conventional tape surfaces. Frictional drag figures include a coating-to-brass specification of only 130gm maximum, backing-to-rubber of 80gm and coating-to-backing of 80gm. The coating gives enhanced performance with fast drives and high density recording formats, such as 6,250 bits/in.

This is a good example of the technological progress being made in magnetic tape performance. Tape will continue to be one of the major data storage media for the foreseeable future, with its many advantages, including high storage density per cubic measure, reliability and relatively low cost.

Derick Bostock is manager, Operations Division, Washburn Data Tech International.

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Coated strips shown in the process of being split into tapes which are reeled up individually.

Things are looking up in the storage world - demand is growing for both discs and tapes

How to make some massive savings

Paul Walton considers a compromise technology invented by IBM

MASS storage is a compromise technology invented and first sold by IBM. Masstor recently became the first vendor to offer competition to it.

Mass storage subsystems, to give them their full title, reduce the access time for retrieving information from very large (often hundreds of gigabyte) magnetic tape systems. They are a compromise between the cheap, but slow and cumbersome magnetic tape and the expensive but faster disc drive.

IBM has been selling its 3850 mass storage subsystem for seven years and has notched up a base of no more than 750 in Europe,

according to the recent Frost and Sullivan report, *The IBM market in Europe*. Masstor announced its M860 mass storage subsystem last year and has been making steady progress on the larger IBM sites.

Murray Langton is in charge of an evaluation of the IBM and Masstor storage systems for the University of London's computer centre. He told *Computer Weekly* about the two radically different approaches: IBM uses its 3850 as a sophisticated back-up for existing discs, while Masstor uses magnetic tape and bypasses the need for discs.

Langton's computer centre is the scientific bureau for univer-

sities in the south of England. Manchester handles those in the north. Both centres store an enormous amount of information on behalf of clients. Manchester has already taken a Masstor M860.

The London computer centre does number crunching for those elected users on an Amdek V8, which front ends the main Cray-1 central processor. As a result it is packed with disc drives. The Centre also holds about 10,000 magnetic tapes on behalf of its users, most of which are only used intermittently.

Langton has two storage problems. The first is that, because of high cost and lack of space, he cannot buy more disc drives to provide the increased storage needs. So he has to increase the number of magnetic tapes used to archive information. Even with strict rationing, these tapes proliferate. If the information held on them is to be accessible some form of automatic tape access is needed.

Commercial sites have much the same problem, which most overcome by more rigorous archiving or by bearing the cost of disc drives: witness despondent users awaiting greater capacity IBM discs during the storage famine of 1981-1982.

Brian Burch, vice-president of Masstor, pointed out the need for some form of intermediate storage medium in a paper he gave to the IBM User Show earlier this year. He said that most organisations have three types of data to store: high activity files accessed frequently and best stored on discs; large and infrequently accessed files best stored on tape for long-term storage; and so intermediate set of files, eg a test file which is active for weeks and then not used for several weeks.

According to Burch: "There is a distribution of file types in any organisation - some used a lot, some not at all. But the bulk are of the intermediate type."

"What most users do is to cut that distribution of files down the middle. On one side they buy expensive discs; on the other side they buy tape, which is used manually. Storage then becomes an economic

decision based on cost. People end up spending more on storage than they should.

They end up paying a premium for the fast access disc, which they don't really need. If you wanted to use a file which hadn't been touched for three weeks and you were in no hurry, then a one second access time is a waste of money."

Burch added that it was hard to educate users that mass storage, whoever they buy it from, is ideal for this intermediate storage of the bulk of their files. He said that this would cut a third off the price of their disc storage, with access time only slightly slower, at 10-20 seconds.

Langton agreed that most files are intermediate ones, and stressed the cost of operator intervention (tracking down and then loading the magnetic tape by hand) or the cost and space problem of adding discs. Files archived on tape might never be seen again, he said. They were effectively forgotten or lost.

Mass storage subsystems address this need. They are boxes consisting of several hundred cartridges, each with a 70ft long, 2in wide strip of magnetic tape coiled inside. Information is stored on the tape, which is automatically accessed by a central arm (for Masstor) or trolley (for IBM).

Langton has just ended an exhaustive review of his centre's data storage needs, and IBM and Masstor have submitted tenders to win his business. He says that mass storage subsystems are cheaper than disc in every respect, and faster than magnetic tape.

The University of London is looking for a 100 gigabyte system, which will cost about £600,000. Equivalent discs would cost a half to a third more, and there would be delivery problems for high capacity models.

Reducing overheads, such as operator intervention, is not the only aim. Access time is important too. The mass storage subsystems each take around 10-20 seconds from a request for information to getting the first piece of it through, said Langton. This compares with 40-50 milliseconds for a set of disc



Inside Masstor's mass storage subsystem.

drives holding the same amount of data, and the unknown time of finding and loading magnetic tape.

Space is becoming expensive, as the number of disc drives, or special peripherals increases, and often it is not possible to rearrange the configuration. Mass storage subsystems are several times smaller than the discs or tapes they replace.

IBM's 3850 is 20ft long, 4ft wide and to 5ft high but expanding the storage capacity can be difficult. Langton explained that, as IBM uses a small trolley, which has to run backwards and forwards in a straight line between the cartridges, expansion can only be in one direction. Adding 50 gigabyte extensions to the basic 100 gigabyte model can expand it from one wall to the other, curtailing further expansion.

The Masstor M860 (which uses the same cartridges as the IBM 3850), is 11ft long and 3ft wide and can grow in any direction. Like IBM's machine, the basic 100 gigabyte model expands 50% at a time but, because its cartridges are accessed by a more flexible arm inside a tub, it can grow upwards and outwards.

IBM has advantages over Masstor because it sells a complete package of hardware and software, which can use intermediate faster discs to design more evenly balanced systems. The 3850 was built to work with 3330 IBM discs (and their upgrades). Masstor's M860 is a direct tape storage system, which needs third party software to work with disc drives.

IBM treats the 3850 as if it were a set of virtual or temporarily used 3330 discs. The central processor calling for information reacts as if the 3850 were simply a slow disc drive. Masstor treats the M860 as virtual magnetic tapes, each of which are listed in a directory and accessed directly by the processor.

While it is possible to use the 3850 simply as a magnetic tape store, most users buy the additional hierarchical store manager (HSM) program so they can use it with discs. This utility moves any file on disc which has not been accessed for some time over to what it thinks is a virtual disc - the 3850 cartridge tape. When the file is again requested it comes back to a fast disc in anticipation of regular use and the need for rapid access.

But there are drawbacks with HSM. There must be enough real disc storage available to store all the real and active files, whether they are being held. Once the number of files entered reaches the

real storage limit outside of a 3850's virtual extension, then occurs - ie the HSM must create space on the disc drive by constantly moving files before and after the 3850.

IBM developed the 3850 as storage system as an aid to its operation, usually under a multiple virtual storage (MVS) operating system. It manages a problem of storing files not accessed intermittently by creating a virtual disc storage space for its to-day operations. Langton claims that it is not intended to expand storage you haven't got.

Masstor supplies a virtual magnetic tape system, and third party software is needed to work it. The idea, said Langton, is to automate the handling of one virtual tape drive, with automatic mounting of the one you want, retrieve information from.

The M860 comes complete with the store management task (SMT) software, which is used to find access the virtual tapes on a half of the central processor. The Masstor is being sold predominantly to IBM MVS users, it is possible to extend its use to other big machines by writing the interface software. (The SMT is accessed by Control Data Honeywell, Sperry and Digital Equipment machines.)

The M860's main advantage is that working directly with magnetic tape is very much slower than having intermediate faster disc drives.

Mass storage subsystems are several times smaller than the discs or tapes they replace

IBM's use of virtual tape techniques means that requests for information can be spread through the fast discs and the 3850.

Langton has begun looking, however, at third party software which will allow the Masstor M860 to use fast discs.

Mass storage subsystems are existing technology. Competition to IBM and the increasing demand for data storage could result in their becoming popular after a quiet start, particularly if their prices come down.

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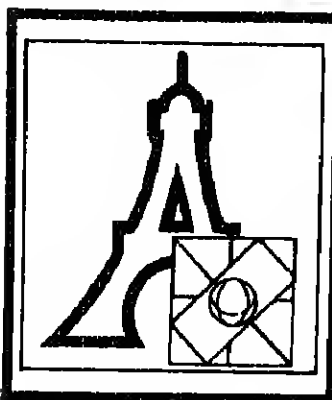
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BURCH... Users cut distribution of files down middle.



LANGTON... Has problem of high cost and lack of space.



Full compatibility is closer

by John Riley
WORLDWIDE compatible computer communications took another stride towards reality last week, when standards bodies ISO and CCITT announced the extent of their collaboration. As a result, both bodies are bracing themselves for increased opposition.

Over the past five years both ISO (International Standards Organisation) and CCITT (Consultative Committee of International Telephone and Telegraph) have been working increasingly closely to draw up the seven layer open systems interconnection model (OSI).

Tom Steel, of AT & T Systems, who is responsible for CCITT's user interface standards, announced at IFIP that both were of virtually single minds now and outlined the future programme.

He foresees problems ahead within the industry and from academic circles: "I realise that it is frustrating for engineers to take part in the standardisation programme. Standardisation means reducing freedom to do things as you'd like, and when working towards a collective design, I agree that some compromise is necessary."

Professor Tohru Moto-Oka, of

mail methods. Formal methods, dataflow design, VLSI architecture, logic programming, networks and communications, logic programming, database design and the social implications of computers made up just a few of the over 100 sessions attended by the more than 2,000 delegates at IFIP '83.

The conference, held once every three years, brings together an intimidating array of university boffins and research and development people from deep in the bowels of the world's computer companies to exchange ideas.

He also warned that "the environment will change with time because of both expansion and failure", and that we cannot assume that they will execute distributed processing with no conflict or asynchronism.

Steel said: "OSI is a human construct, and is a rational way to

The debate is often convoluted, sometimes boring, and seemingly far removed from the day to day life of the data processor.

But among the delegates were those who will lead us into the next generation of computing. IFIP, the International Federation for Information Processing, now has 43 nations as full members, with a permanent secretariat in Geneva, Switzerland. Last week IFIP returned to Paris, where it held its first world computer congress. John Riley and David Craver report.

work. Whether it is perfect or not isn't the issue. The question is whether it is workable and acceptable to the vast majority to accomplish what they want to do.

"People using the system should be able to use a different system quite independent of the physical nature of the boxes, either hard or software."

The programme is moving ahead rapidly with the basic reference model, IS 7498, carried, good progress reported for the transport layer standards, and the session layer standard is expected to be upgraded from a draft proposal to a draft international standard.

Steel said: "OSI is a human construct, and is a rational way to



AMDAHL... Using "new" methods.

Amdahl is talking about his chip

GENE Amdahl confirmed that he is talking to most of the major computer manufacturers about licensing of his radical new chip design for large computers. With licensing agreements with Sperry, DEC, and Compaque Machines Bull under his belt, further deals can be expected in the near future.

If big machines drive technological advance in computers, Gene Amdahl is the man to listen to.

And Gene Amdahl's address to IFIP's Ninth World Computer Congress had the larger of the conference halls at Paris' Palais des Congrès packed to its wings. Amdahl, who designed the IBM 360, was coy about giving further details of the machine which will emerge from his new company, Trilogy.

But he said enough to whet the appetite of at least one IBM research and development man, who probed for further details on the Trilogy chip design.

Asked what redundancy methods Amdahl would use to get high yields on his wafer-level integrated chip, Amdahl would only say he was using "new" methods - "but I am not going to explain them yet."

Amdahl said the design architecture for the Trilogy machine is completed, and was now undergoing simulation. Water seal integration has been built, and works, he said. Speeds will be 30 times faster than the fastest commercial scale systems now available, he promised.

Amdahl said the new system would be ultra reliable, with 40 years the meantime between failure of chips, and a four per cent meantime failure for the complete system, excluding peripherals.

The problem with the child water cooled system is not cooling, but the amount of power taken in and out, he said.

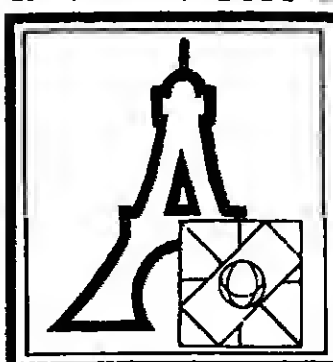
The architecture of the system is entirely new, with deep pipelines to a maximum of 64 instructions. Amdahl is sticking with the 1985 as the date for first delivery of the system, in spite of industry doubts. He promised a price performance below that which any of the plug compatible manufacturers could offer, and below that of IBM's promised new machine, the Sierra.

Amdahl confirmed that he is pressing ahead with his plans to publicise with Trilogy in mid-October. He was off to meet potential European investors in Trilogy as soon as he finished his address.

Most expert systems to date have been designed with a consensus of knowledge. "How accurate," asked Les Gasser, professor of computer science at UCLA, "do we assess the legitimacy of a body of knowledge over another?"

Gasser cited as an example the medical practices of an expert system to treat the whole patient rather than just the symptoms.

Reinforcing Nygaard's comments, Nils Bjørn-Andersen, of



by John Riley
"C" is rapidly becoming the most popular programming language for language processing projects in Japan. That was a consistent message from the IFIP '83 conference.

Toshiba uses C extensively in its Japanese language translation system and in its forthcoming voice activated word processor, and NEC Corporation's VLSI microprocessor strategy for the 1980s incorporates a C oriented instruction set.

"C is very popular in Japan because it is very powerful at memory handling and is a compact language," explained Dr Kenichi Mori, manager of the Information Systems Laboratory at Toshiba's R & D centre in Kawasaki. "It needs less memory than, for example, Lisp, which is very memory hungry."

The small men still believe in mainframe

IFIP's world computer congress, traditionally a gathering of "big machine" people, is being subjected to the cancerous inroads of the microcomputer.

But Gordon Moore, chairman of Intel, the company which started the microcomputer revolution, told the congress that those in the small system world did not believe the big machine would disappear as more functions are put on the chip. Moore saw a co-existence between mainframe and microcomputers as large and more complicated networks are centred around the mainframe.

At the same time, he said, functions on large machines will come down to small machines. The possibility has been reached already, Moore said, of putting the whole IBM 370 instruction set on a single chip. That was a possible, and logical direction for someone to take, which would make an enormous software base available at the personal computing level.

While Moore said it was extremely difficult to predict more than a few years into the future, he believes the ability to build more complex structures will continue as in the past. Silicon, he thinks, will continue to be the most widely used material, because of its wide availability compared with substances such as gallium arsenide, which will be used only for specialised applications.

Moore also indicated that many applications will stop at 16-bit processors, since such processors



C hits a high note in Japan

Mori delivered a paper which illustrated how Toshiba is applying artificial intelligence to office automation to help users communicate with computers.

The structure of the written and spoken Japanese language has been the impetus for rapid developments in the application of that philosophy to man-machine interfacing in Japan.

Written communication is slow, as the Kanji character set has over 3,000 characters in daily use, compared with our basic alphabet of 26. A simplified Kana character set with about 50 letters exists, but does not produce easily understandable Japanese sentences.

That situation made typing slower than handwriting, thereby providing a considerable incentive to producing an efficient computerised translation system. In 1974 Toshiba launched its Kana to Kanji translation system which

for an information system the machine has to have some store of human knowledge, even if very small, and has to accept human communication.

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That situation made typing slower than handwriting, thereby providing a considerable incentive to producing an efficient computerised translation system. In 1974 Toshiba launched its Kana to Kanji translation system which

stores word knowledge (it has a 30,000 word dictionary) and grammatical knowledge, allowing rapid written communication, at 120 characters a minute.

Since then, Mori explained, Toshiba has built in that foundation, and is shortly to announce a voice activated word processor. The Japanese language is much less complicated than European languages for this, as it has only 101 different syllables and each corresponds to a unique Kana character.

The new system stores word and syntax knowledge, recognition knowledge, and acoustic/phonetic knowledge, and Mori claims, can handle 100 syllables a minute with 99.8% accuracy.

Mori also provided details about a Kanji optical character recognition system launched last year and a line drawing understanding system, which can translate sketches into tidy plans.



BRANSCOMBE... Take human factors into account.

Wet finger approach lives on in design

THE "wet finger approach" lives on in the design of computer systems, said Lewis Branscombe, head of research at IBM. Branscombe put forward at the IFIP conference some "best guidelines" for developing systems architecture which takes the human factor into account.

Branscombe said that while "we know that there are significant and widespread implications of system architecture on user friendliness, next to nothing is known about how to make fundamental architectural decisions as a result of an emphasis on human factors."

Branscombe said it was important that all programmers, architects, and documentation writers have some appreciation of human factors.

Standards for human interfaces would seem a high priority, he said, but not enough is known about software human factors to make standards intelligently.

Branscombe's first design guideline for system developers is to separate the system user interface from the rest of the system. That way changes to the user interface can be made without a complete rewrite of the program.

He also said individuals often communicate better using "more channels" - for instance, a mixture of audio and visual. That, he said, is a fundamental principle of information processing which has not been capitalised upon.

Another suggestion Branscombe made was a "layered" interface, by which the command or menu interface could be altered according to the use of the machine and the user's level of expertise.

On the same line Branscombe suggested "personal interface preferences", which may eventually lead to users carrying a magnetic card to plug into a system to describe their personal data.

Branscombe said that in system design we must be aware of the world as it is even as we try to make systems more operational.

He described an editor/formatter system under development at IBM's Cambridge research centre, called Polite, which can "undo" what users have done and back-up to the last action, a number of actions, or even to the beginning of a session. This kind of facility, Branscombe said, is often forgotten by systems designers.

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Commercialism stays the driving force

COMMERCIALISM, not interaction, has been the driving force in most US citizen participation computer projects in the US.

Bill Dutton, an associate professor at UCLA, drew on case studies he has done in Los Angeles to explain how community interactive cable television is more interested in market share and production quality, without controversy, than in audience participation.

His case studies also showed that the services are primarily used by wealthy communities, putting paid to the notion that such services might widen the decision making process to less privileged sectors of society.

Many technological systems, particularly cable systems, are looking for a problem, according to Tomas Ohlin, a Swedish authority on the videotext industry.

Many people are buying personal computers without knowing what to do with them - an example of technology waiting for an application. But when cheap

moderns are available - as is happening in parts of Europe - millions of terminals will be available.

Starr Roxanne Hiltz, of the New Jersey Institute of Technology, warned of the potential elitism of such systems. Corporations and the wealthy would pay for access, but who would pay for the average citizen? she asked.

But to show the potential, Hiltz described the Electronic Information Exchange System (EIES), a computerised conferencing system designed by Murray Turfitt, which is being used by President Ronald Reagan as a backdrop to an October "White House Conference on Productivity". Around 200 participants used online micros in their homes to prepare a presidential report on how to improve productivity in the US.

The participants judged they had produced high quality recommendations far better than would have been possible in face to face meetings.

Scientists want to be free from technology

THEORETICAL computer scientists want to be freed from technology, which is forcing them to run before they can walk. That was the message from a discussion on "tough nuts" in theoretical computer science held at the IFIP conference.

"Computer science is dominated by technological developments," said Juris Hartmanis of Cornell University. "Applications are exploding and computer science is being pulled apart and not being allowed to develop peacefully."

Dines Bjørner, of the Danish Data Processing Centre, agreed with the sentiment: "The process of development is more important than the product," he said.

The academic computer scientists want to find a common First Law to establish the theoretical foundations for computer requirement analysis and definition so as to free computer science from technology - they are searching for a computing equivalent of the

First Law of Thermodynamics. Several top theoretical computer scientists were asked to set out what they saw as the fundamental problems of computer science. "A key tough nut in artificial intelligence is how to create a commonsense database," said John McCarthy, of Stanford University.

"For example, how do you change an airline reservation system directly so that Iraqis don't sit next to Iranians?" he asked. "The aim is to change the programs without reading them and that needs a commonsense database."

"There's too much emphasis on syntax of natural language," he continued. "For more powerful programming languages we need to concentrate more on the semantics of natural language."

"A real problem is to find a theorem to show that the time taken to compute equals the size of the task divided by the speed of the computer," McCarthy concluded.

SOFTWARE AND TECHNOLOGY

"We never looked back" is typical of the comments made by users of Apple's Lisa, the mouse-driven computer. Users are adapting quickly and naturally to mice, especially where the software makes full use of the mouse capabilities. Just think how many times you have to push different control buttons in, for example, a word processing package. How much easier it would be if the functions were indexed on the screen and all that was needed was to move the mouse on your desktop and push a button. In fact, extensive research into the use of mice has shown that users become very proficient and able to move the mouse swiftly and accurately, running through a sequence of commands much quicker than otherwise possible. In most cases, the mouse was preferred to the comparatively strenuous activity of leaning forward to touch screens, or the imprecise track-ball. Why not try a mouse?

Providing a consistent upgrade path has been one of the prime design objectives behind the MS-DOS operating system. This upgrade path allows both software developers and users to take their programs from one computer to another. MS-DOS initially provided the upgrade from the 8-bit world of CP/M-80. Today, MS-DOS runs on the vast majority of 16-bit systems and is firmly placing itself as the operating system for the future. On the other hand, in the world of multi-user microcomputers, the XENIX operating system is well established. The latest versions of XENIX, and the latest version of MS-DOS share a certain amount of compatibility which allows properly written programs to run on both systems. Operating systems such as XENIX have long been used in communication and mailing systems, offering the ability to work on many programs simultaneously. Now these features are being brought to future versions of MS-DOS by Microsoft, the company who also supplies XENIX. The upgrade path will then extend across single and multi-user micros, and across all the major microprocessor families.

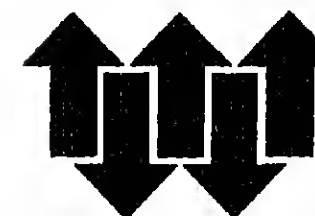
With today's rapidly changing hardware market, micros almost become out of date if they are more than six months old. For software developers, this poses something of a problem. The packages developed on one machine will have a lifetime limited by the success of that particular hardware. What the software developer needs to look for, is the right development environment. Based on the MS-DOS operating system, presumptions to assume that these will be the mainstream machines in 12 months' time. What the developer needs, is a consistent development environment (one which allows him to run his software on many different machines immediately) and one which will be there on future generations of micros. Having already eased the transition from 8-bits to 16-bits, MS-DOS is now offering compatibility with the popular XENIX multi-user operating system. MS-DOS will shortly give access to the new, exciting world of graphics, multi-tasking and networking. For the software developer, a forward-thinking development environment of this kind spells success in an otherwise unstable market.

About that 'development environment' - from portables and IBM 'lookalikes' to any of the other major 16-bit micros on the market, one thing is clear, namely, that there is a firm commitment by computer manufacturers to offer this consistent development environment. Have you noticed how almost every newly announced 16-bit micro comes with the same operating system, MS-DOS? From the major manufacturers such as DEC, Wang, IBM, Data General and NCR to the 'portables' manufacturers, such as Hyperion, Compaq, Gavilan and ACT's new Apricot, MS-DOS is always offered, generally as that manufacturer's preferred operating system. Look also at those machines now on the market which do not even have the boards to run MS-DOS, and Apple is rumoured to be thinking along the same lines for its revolutionary Lisa computer. So, wherever you go, it looks as though you'll always be able to take your favourite software packages with you.

MICROSOFT

Microsoft Ltd, Piper House, Hatch Lane,
Windsor, Berkshire.

AUTUMN
COMPUTER
TRADE
FORUM 1983



National Exhibition Centre
Birmingham 4/7 October

Computer sales in UK rise faster than expected

John Aczel reports a dramatic growth in the market for systems and peripherals, despite a slackening off in other industries

SALES of computer systems and peripheral equipment in the UK have speeded up and overall demand has grown faster than expected. The latest statistics indicate buoyancy in the computer sector and this is likely to be well maintained during the next 12 months.

Over the past year, demand for hardware has expanded markedly and in 1982 it is estimated that sales have totalled £1,500 million at manufacturers' prices. This does not include wholesale and retail margins, and the value of the market was much higher when all distribution costs are taken into account.

Growth of the market in 1982 has been quite pronounced, despite the slack conditions in British industry as a whole. The overall growth in demand has averaged 15 per cent, but this has varied considerably according to the product groups concerned. Allowing for inflation, the real growth has been at least 10% after taking into consideration increases in retail prices. This is probably an underestimate as costs of many computer products have been falling sharply and the volume of demand has grown much faster for a number of products, particularly for disc storage units and printers.

There is little doubt, however, that the computer sector has been one of the most dynamic areas in the British economy. During 1982, gross domestic product increased by only 1% and, in most parts of the British economy, demand has been slack. Thus, the computer sector has had a truly outstanding performance, and this expansion is likely to be surpassed by a wide margin during 1983.

Through a number of estimates have been made about the size of the market for both computer systems and peripherals, the official statistics contain many gaps and their information is not fully comprehensive. Only the bigger companies take part in the survey carried out by the government and, according to the official estimates, about 90% of establishments are included in the investigation. Some of the figures are subject to considerable revision, and any statistics given at this stage have to be treated with considerable care because of this.

Overall statistics about the size of the market are not available and various ways have been used to assess this trend in the computer sector. One of the best methods is to take the production figures and adjust them by exports and imports to get a crude idea of sales. But this is a crude method and does not allow for a number of factors, particularly changes in stocks.

In addition, the price levels may be somewhat confusing, though in most cases they are at manufacturers' prices. To make allowances for distribution margins, particularly for wholesale and retail costs, is impossible, as they vary considerably according to the product.

Total sales of computer systems have been expanding in 1982 and it is believed they amount to around £560 million which was a growth of 10% compared to 1981. The official statistics do not break them down in terms of mainframes, minis and micros, but it is reckoned that, for sales for micros the rate of expansion has been much higher, possibly averaging over 40% in volume terms.

Production of computer systems and central processing units has also gone up and reached about £390 million. The official figures reveal a growth of only 7% for output, but this may be due to the fact that they are not fully comprehensive.

The latest figures for production refer to the first quarter of 1983 and they show that output has gathered momentum in the quarter. Output amounted to nearly £124 million, which was up by over 20% compared with the same period in 1982. It is believed that the trend has been gathering speed and that this growth will be well maintained in 1983.

Exports of computer systems have made good progress throughout 1982 and reached over £300 million. This was a rise of 30% compared to 1981, while for the first quarter of 1983 sales advanced by 26% to reach a record of £87 million.

Exports to the EEC countries have moved ahead markedly. Sales to France reached £13 million for processing units, while to Germany they amounted to £18 mil-

Netherlands. As a result of the sharp increase in imports, Britain's trade balance for computer systems and CPUs went further into the red. The situation was already critical in 1982, when a gap of over £170 million was seen. For the first quarter of 1983, this imbalance was growing and reached £70 million during the period.

Foreign suppliers of computer systems are now presenting a strong challenge to British-based firms, and at the beginning of 1983 they accounted for 80% of total sales within the UK market. This proportion has been rising and could continue to go up despite the strength of the dollar, which is forecast to continue in the coming months.

Demand for peripheral equipment has grown even faster than for computer systems, and in 1982 the size of the market for add-on equipment amounted to around £350 million. This was up by 18% compared to the previous year, with a particularly fast growth being shown for printers and storage units.

According to the latest figures,

Foreign suppliers of computer systems are now presenting a strong challenge to British-based firms and at the beginning of 1983 they accounted for 80% of the total sales within the UK market. This proportion has been rising and could continue to go up despite the strength of the dollar.

lion. A strong growth in other European countries has also been seen, with significant expansion reported in Italy, the Netherlands and Belgium.

Trade has been progressing well in other parts of the world and useful gains have been recorded in the US, Australia and some of the Eastern European countries. The fairly low level of sterling has made exporting easier, though competition has been quite fierce in many overseas markets. Thus prices of CPUs have been dropping and have averaged a fall of about 20% compared to 12 months ago. Even so, British manufacturers have been willing to accept these price cuts, especially as the exchange rate has been to their advantage in recent months, particularly against the dollar.

Imports of computer systems have also risen sharply, and in 1982 they amounted to £476 million. This was a gain of about 25% compared to the previous year, while the trend has gathered considerable speed in the early part of 1983.

Total imports in the first three months of 1983 moved up to £157 million, a growth of 50% compared to the same quarter in 1982. The underlying trend for computer systems has been very strong, particularly from the US.

Deliveries by the US accounted for over 30% of the total in terms of processing units and complete systems, and for the first three months of the year they were valued at nearly £50 million for CPUs on their own. Imports of CPUs from West Germany have also been at a high level, totalling £13 million in the first three months of 1983, while significant sales have come from suppliers from Denmark, France and the

however, expansion has been even more rapid during the first three months of 1983. Total sales amounted to £285 million at manufacturers' prices and were up by 30% compared with the same quarter in 1982. Growth has been higher than expected, and by volume, this rise has been even sharper, in view of the fall in price in many peripheral items.

Production of peripherals has also gone up, but not as fast as overall demand. Thus output reached £183 million in the first quarter of 1983 which was a gain of 14% compared with the first quarter of 1982. Last year, output for peripherals moved up relatively slowly at 6% and amounted to £167 million. Clearly, production has not kept in line with overall sales, and the differential has been made up by the substantial increase in imports for peripherals.

In 1982, total imports of peripherals rose by over 30% to nearly £720 million. British imports of disc storage units in the first three months of 1983 amounted to £53 million and the value of imported printers jumped to £39 million. Foreign deliveries of VDUs have also been higher and amounted to nearly £30 million in the first three months of 1983, and a strong growth in terminals and other types of equipment has also been seen.

Competition in the peripheral market has been intense and the US has maintained a strong lead. Its sales reached £115 million in the first three months of 1983, a major challenge has been seen from some of the Far Eastern producers, particularly Japan. Japanese sales of peripherals continued to make strong progress, and amounted to £16 million. For some product groups, in-

port prices have come down significantly and, in the case of printers, dropped by about 50% in imported prices. Evidently some foreign manufacturers have been willing to cut their prices sharply in order to keep their volume at a satisfactory level during this period.

Exports of peripherals have also performed well and amounted to £440 million in 1982. This was an increase of 20% compared with the previous year, while for the first three months of the current year, sales from overseas markets have gone up by around 15% to £116 million.

British exports have been concentrated in certain areas and have performed particularly well with VDUs. Their value went up to £40 million in the first three months of 1983, while a useful increase has also been seen for disc storage units, with their value amounting to £19 million in the first three months of the current year. It is estimated that over 130,000 peripheral units were sold abroad and the average price has been coming down sharply.

Several bullish factors are likely to influence demand for computer systems and peripherals. For one thing, the general economy in the UK is showing signs of picking up, even though the process may be relatively slow. For instance, the growth in gross domestic product could average 2.5% this year, following a minimal rate of increase in 1982. Interest rates are now fairly stable and lower than they have been in previous years. This is important as it should enable companies to install new computer systems at lower interest charges.

In addition, the profitability in industry is improving and the cashflow of many firms is showing signs of perking up. Thus there will be more resources available for commitment to new computer systems as well as to extending existing ones.

As a result capital expenditure, which has been at a fairly low level over the past few years, is improving, and, according to the latest forecasts, total investments will increase by at least 5% in real terms. Naturally, computer installations only represent a small proportion of overall capital expenditure, but above average outlay on computers is expected in the financial sector, the service industries and the oil sector.

In addition, prices of computer systems and peripherals are coming down sharply and this is opening up the market considerably.

During 1982, the market for computer systems and peripherals was estimated at £1,500 million at manufacturers' prices. A growth of around 30% is quite possible for this year and overall demand could reach about £2,000 million in 1983. Naturally, these are only tentative estimates, but they highlight the strong growth likely to occur in the computer sector during 1983 and which will be well maintained in the coming year.

On present trends, an above-average growth rate will be seen in the peripheral sector and sales of certain items will increase rapidly. In particular, demand for efficient and cheaper printers as well as for high capacity storage units is likely to be at a high level. Competition in these fields, however, will remain fierce.

TABLE 1: PRODUCTION OF COMPUTER SYSTEMS IN UK (including central processing units)

	£m
First quarter 1981	95.5
Second quarter 1981	87.0
Third quarter 1981	80.1
Fourth quarter 1981	94.2
First quarter 1982	102.0
Second quarter 1982	86.1
Third quarter 1982	104.0
Fourth quarter 1982	95.0
First quarter 1983	123.3

TABLE 2: EXPORTS AND IMPORTS OF ELECTRONIC COMPUTER SYSTEMS (by value)

	Exports £m	Imports £m
Fourth quarter 1981	80.3	112.7
First quarter 1982	68.8	105.3
Second quarter 1982	71.5	114.1
Third quarter 1982	69.2	114.6
Fourth quarter 1982	92.1	142.5
First quarter 1983	87.3	156.9

TABLE 3: SALES OF ELECTRONIC COMPUTER SYSTEMS IN UK (including central processing units) - BY VALUE (£m)

	1982	1981
Production	123.8	95.0
Exports	87.3	92.1
Imports	156.9	142.5
Sales	193.4	145.4

TABLE 4: PRODUCTION OF PERIPHERAL EQUIPMENT IN UK

	1983	1982	1981
Storage units	£m	£m	£m
Input/output units	20.1	17.8	18.5
Other units	100.5	110.2	93.2
Other offline data equipment	62.9*	60.7	45.6
Total	183.5	194.0	161.1

* Estimated

TABLE 5: TREND IN PRODUCTION OF STORAGE UNITS

	£m	Index First quarter 1981=100
First quarter 1981	20.0	100.0
Second quarter 1981	16.4	82.0
Third quarter 1981	15.8	79.0
Fourth quarter 1981	19.2	96.0
First quarter 1982	18.5	92.5
Second quarter 1982	16.1	80.5
Third quarter 1982	23.0	115.0
Fourth quarter 1982	17.8	89.0
First quarter 1983	20.1	100.5

TABLE 6: TREND IN PRODUCTION OF INPUT/OUTPUT UNITS

	£m	Index First quarter 1981=100
First quarter 1981	86.9	100.0
Second quarter 1981	87.3	100.5
Third quarter 1981	84.5	97.2
Fourth quarter 1981	110.8	127.5
First quarter 1982	93.2	107.2
Second quarter 1982	93.5	107.6
Third quarter 1982	103.9	119.6
Fourth quarter 1982	110.2	126.9
First quarter 1983	100.5	115.6

TABLE 7: IMPORTS OF PERIPHERAL EQUIPMENT IN UK

	First quarter 1983	Fourth quarter 1982	First quarter 1983
Storage units	£m	£m	£m
Input/output units	213.5	193.9	157.0
Other units			
Punchers, verifiers & calculators	0.1	0.1	0.2
Other offline data equipment	3.1	2.6	6.4
Total	217.7	196.6	163.6

TABLE 8: EXPORTS OF PERIPHERAL EQUIPMENT IN UK

	First quarter 1983	Fourth quarter 1982	First quarter 1983
Storage units	£m	£m	£m
Input/output units	114.4	121.9	100.9
Other units			
Punchers, verifiers & calculators	0.1	0.1	0.2
Other offline data equipment	1.6	3.1	10.2
Total	116.1	125.1	111.3

Where the dealers go to do their dealing

Philip Hunter previews the fruits to be picked in Birmingham's NEC next week

A RICH selection of micros and associated terminals, printers and disc drives will be on show at next week's Computer Trade Forum. The big companies are implemented by Burroughs, Honeywell, Perkin-Elmer, Texas Instruments and Elgar Dynamics, which distributes small business systems from these three industry giants, as well as DEC systems.

The reason for Burroughs' presence is to demonstrate to the trade that it offers perhaps the largest range of compatible computers, ranging from a £3,500 micro to a £250,000 B1985 mainframe. Perkin-Elmer's motive is to demonstrate the new 3206 supermini linked to its OEM Partnership Plan, which gives attractive discounts to OEMs.

Of particular excitement to dealers is the presence of Texas Instruments with its new TI Professional Computer. TI has come to the Forum specifically to find UK dealers for the computer, and to appoint authorised distributors for a new range of printers and terminals.

TI recently signed a contract in the US with retail chain Computerland, typical says the company of the outlet wanted in the UK. But there will also be room for smaller dealers, and TI is keen to push its own support and public relations facilities to help them.

Sapphire Systems, the UK software producer and distributor, is at the Forum to find dealers for its Profitlink scheme. The idea of this is that dealers attend training courses at £45 a day, and then pay a £95 a month membership fee, in return for the usual preferred dealer status plus regular advertising of Profitlink dealers as a group in computer magazines.

Datscope Micro Systems of London is another to launch a dealer support package, for the powerful Fortune 68000-based micro. And maintenance and supply company Terminal System Services will advertise its support package, which includes a final check of hardware before dispatch, and education of end users.

Consor Electronics will be at the Forum to promote its range of services including test, repair, installation, training and on-site maintenance. The company boasts that it carries out servicing to the Ministry of Defence Standard 0521, and offers an emergency service to fix circuit boards in 48 hours.

The fashionable artificial intelligence is represented by a company called Expert Systems, which will push several versions of the language Prolog.

The company will show Prolog Interpreters running under VMS, RT-11, RSX-11M, CP/M and MSDOS, and it will be on the lookout for distributors to sell these versions of the language.

Also in keeping with the times, there is a fair turn out of software producers and distributors.

Logica VTS is to demonstrate its Pilot VTS system, which uses the Polynet local area network to connect workstations based on the company's VTS 2200 and Vitesse hardware.

Logica VTS, another exhibitor at the Forum, Modata Computer, both use file servers for local area networking, which means that several users can simultaneously work on a common database. Modata will be exhibiting its Micromaster product, which sounds quite similar to Logica's. It will be interesting to compare them at the show.

Visitors will also be able to see

for themselves how close the promise of the paperless office has become. Sostoff will show a package called Tomorrow's Office, an applications generator for the IBM Personal Computer and the Sirius micro. This includes word processing, statistics and report writing and allows the user to hold variable length records, limited only by machine memory.

Sostoff also has a version of the product, called Administrator, for the Commodore 8000 machine.

Another increasingly popular computer application is point-of-sale for single shops and retail chains. Nokia UK will be showing its offering - called Point-of-Sale - which offers users the option of starting with a single station and expanding to up to 32 stations controlled by a central minicomputer.

Traditional accounting software will be demonstrated by The Financial Director Software company with its product called, not surprisingly, Financial Director. Despite its grand name, the product is not radically different from others in the market.

Holland Automation International will be launching its new Hai*Line package of integrated business software running under Microsoft's MSDOS. It will be demonstrated on several micros, including DEC Rainbow, IBM PC, Wang Professional and the ICL PC2.

For companies which want to do their own programming, Software Ireland will have its Sibol on show, which is a commercial programming language for the Unix operating system written in C.

Visitors will be bombarded with propaganda for 16-bit micros as they look at the various micro

A decent printer can bump up the cost of a small business system by as much as 50%

offerings. But not all 16-bit machines are the same.

Essentially there are two kinds: single user personal computers, often based on the Intel 8086 processor, and multi-user workstations which are several times more expensive, and often based on the Motorola 68000.

These 68000-based computers are often called 32/16 bit machines.

General Automation UK will demonstrate a range of machines in this category. The machines are priced between £8,400 and £31,000 and begin with a desk top micro and end with a machine which the company claims will support 32 terminals, although in practice it is unlikely that more than about 16 users could work simultaneously.

Kode promises to announce a new range of these high powered super micros and will be looking for dealers to sell them. And Motorola itself will proclaim a new range of business systems to compete with the many machines that use its chips. The company's Information Systems Group will introduce the S2000 range, which, says the company invitingly, the tools to attack vertical markets.

The popular Fortuon supermicro will be exhibited by one of the two appointed UK distributors for it, IBR Microcomputers, along with a range of financial software.

The line between supermicro

and minicomputers is pretty blurred these days, the only discernible difference, apart from physical size, being that minis can usually support more peripheral equipment. Adds Mentor can perhaps claim that its 16-bit machine at the Forum is a mini, since it allows, in theory at least, up to 64 users, and up to 600 Mbytes of hard disc.

There is little doubt that the machine to be unveiled by Nnrsk Data, Norway's biggest indigenous computer maker, is a true mini. The company's new ND-570 outperforms most rival minis, and according to some bench tests, is top in the price/performance league, above the DEC Vax and Gould's supermini.

A computer is not much use without some backing storage, and hard disc is the option that combines plenty of megabytes with fast access. Century Data Systems will be showing various of its disc drives, including removable drives based in Winchester technology.

Cristie Electronics will be giving

standalone personal computers based on the Intel 8086 - such as the IBM PC - typically cost around £2,000. Perantini is to demonstrate such a machine at the show, the Argus Pro-Personal.

Tycom will be showing its Microframe based on the Intel 8088 with the option of adding on a 68000 and several Mbytes RAM to make a powerful multi user supermicro.

This can be seen at the Forum with Micro Peripherals offering a daisy wheel printer which delivers a high quality print for only £399, plus VAT. The same company also has a dot matrix printer, which produces a not-so-good print, for £28, plus VAT. Both these products are, needless to say, of Japa-

neese manufacture. Of the big companies that specialise in printers, Centronics is absent from the Forum, but Monomatrix Tally will be there to demonstrate the full force of its produce range.

Quine UK will be showing its Sprint range of daisy wheels, and Westwood Distribution will display the popular Epson dot matrix printers on display.

Some printers are capable of plotting simple graphs, but for those who want a dedicated plotter, Holdene Trade will be exhibiting the Gould Bryan's colourwriter digital plotters.

9,830,400 bps

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PRODUCTS



Digital Engineering's DQ640 series Retro-Graphics enhancement.

Add Retro-Graphics to DEC's terminals

DEC VT100-Series video terminals, including the VT100 and VT102, can be upgraded to emulate Tektronix 4010/4014 graphics terminals with the addition of new DQ640-series Retro-Graphics terminal enhancements, manufactured by Digital Engineering.

Offered for \$970 to \$1,195 list price, DQ640-series models are printed-circuit card and CRT assemblies that install in DEC terminals, provide Tek 4010/4014 graphics features, and compatibility with programs written for Digital Engineering's VT640-series Retro-Graphics for DEC displays.

DQ640-series is available in 800-by-480 or 800-by-240 bit-map resolution.

With more than 25,000 installed, the widespread use of Retro-Graphics has prompted the

domestic DEC Field Service Organisation to offer both on-site and depot maintenance/service programs for Retro-Graphics updated DEC terminals.

Because it is 4010/4014-based, Retro-Graphics can be used to draw dot/dash/solid vectors, plot points, and transmit X-Y co-ordinates with a crosshair cursor. Additionally, 800-by-480 resolution models can be utilised for displaying all four Tektronix 4014 character sizes.

For terminal set-up, a unique user-friendly menu allows the operator to define and control graphics features, communications, and characteristics of I/O peripherals.

Digital Engineering (CW), 630 Bercut Drive, Sacramento, CA 95814.

Single mass memory for 12 terminals

A COMPACT 5¼-inch Winchester disc unit with 18 or 36 Mbytes capacity now available for Commodore machines can provide simultaneous mass memory for up to 12 terminals.

The hard disc unit is marketed by IMI Computing.

Commodore Basic 4, DOS 2.5 and IEEE488 compatibility mean that programs written for CBM 8000 series can be used almost without modification. In addition up to 40 relative files can be opened at the same time.

IMI Computing (CW), PO Box 216, Witton, Birmingham B6 7BA. Tel: (021) 356 4848.

Low-level monitoring system for £20,000

THE PMS Starter Package, a complete working production monitoring system, including hardware and applications software, from General Automation, is priced at under £20,000. GA plans to capture that part of manufacturing industry which has been deterred from introducing computerised monitoring systems on the basis of cost, and encourage the speedier introduction of pilot schemes in the larger concern.

Wally Walls, marketing manager of General Automation UK, said: "We have had considerable success with the comprehensive PMS system launched in 1982. A diverse range of industries, from bottling plants to engine block makers to writing instruments component manufacturers, has achieved increases in productivity of 10% upwards."

The PMS Starter Package is based on a GA Boss 20 16-bit

Low-cost drum plotter for mini or micro users

THE low cost DMP-42 drum plotter from Houston Instrument, launched in the UK by Sintrom Electronics, is suited for use with any micro or minicomputer to produce drawings for engineering, CAD/CAM, building and surveying and scientific research and development applications.

The price, £2,360, is claimed to be the lowest for an A1/A2 plotter on today's market.

The DMP-42 can be used to plot complex plots such as topographic maps, weather charts and piping layouts for chemical plants. It will plot on 16.5x23.4 inches and 23.4x33.1 inches media, as well as on architectural 24x36 inch media.

Using a software or built-in firmware pause command, it is possible to change the pen to plot in as many distinctive colours as are required for each application.

The DMP-42 is supplied with an adjustable floor stand which allows the plotter to be placed at desk height for ease of use. Bond, vellum, clear film or synthetic plotting media are precisely registered under the moving pen by a

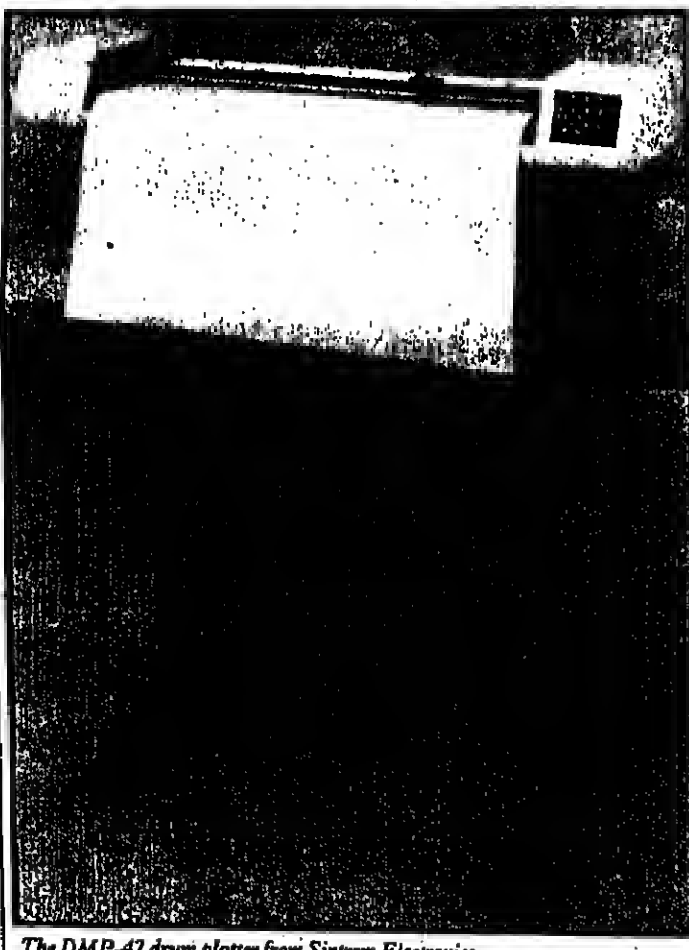
unique high-traction surface area on the drum.

Dedicated microprocessors control the motion of both pen and drum to provide almost free drawings. A powerful instruction set, which resides in the read-only memory, enables the user to generate curves, arcs, ellipses and circles of any required size using simple one-line commands, with 11 different line types, including solid, dashed and dotted. The complete alphanumeric character set can be drawn at any of 360 possible angles and 255 sizes, either straight or italic.

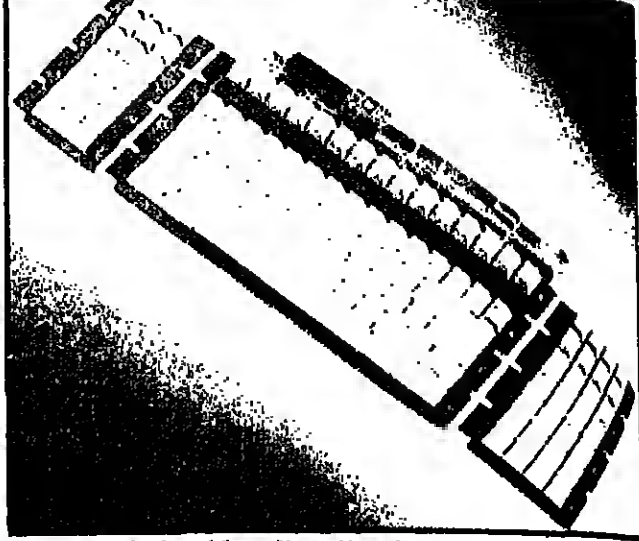
Aspect control is provided in which one or both axes of the character may be varied, and the ability to draw only a portion of a plot and to scale drawings up or down is also resident in the ROM.

Communication with the host computer is provided via an Industry standard RS-232-C interface. The plotter will perform reliably at user-selectable baud rates ranging from 110 to 9600.

Sintrom Electronics (CW), 14 Arkwright Road, Reading, Berks. Tel: (0734) 875464.



The DMP-42 drum plotter from Sintrom Electronics.



Multi-option keyboard from Cherry Electrical.

Multi-option keyboard offers 12 layouts

A NEW keyboard concept called the multi-option keyboard, designed to meet the demand for customised keyboards using off-the-shelf standard modules, is introduced by Cherry Electrical.

Cherry's marketing director, Robin Brewer, says this approach allows designers to obtain custom keyboards without incurring the heavy costs of a true custom design and is aimed at low volume keyboard users who have difficulty obtaining a standard keyboard to fit their exact needs.

The multi-option keyboard comprises three main modules which may be mixed in various configurations to provide 12 possible layout options, including qwerty, and qwerty plus special functions combined with either or both 3 x 7 or 4 x 7 keypad clusters which can be located at either side of the keyboard in various configurations.

The modules interconnect both mechanically and electrically and there is also a sophisticated

electronics package offering options such as a choice of auto-repeat, parallel or serial put in TTL or RS232C format with a choice of data rates.

The multi-option keyboard is Cherry's latest generation of keyboards with a choice of flat or sculptured keys. The keyboard will also be made shortly with low profile keys.

The qwerty module offers 61 keystrokes including a shaped key and a further 10 function keys, eight of which are illuminated. These keys may be populated or depopulated to meet the user's exact requirements.

In addition, the parallel options can be tri-state under control while up to eight lines can be controlled remotely by the user.

Cherry Electrical Products (CW), Cuddihoe Lane, Bishops Cleeve, Leics LE6 9JQ. Tel: (0532) 631100.

A record of what is being sold—and when

A NEW point-of-sale data collection terminal, the QSS500, from Quality Systems International, offers a sales, stock movement and administrative record.

While the system is primarily designed to provide management information, the terminal looks like a conventional cash register, and "leads" the operator through sequences for all transactions.

This is achieved through the terminal's 40 character alphanumeric display, each side of which can function independently of the other, so that for the customer, selected information in a message can be given.

To help speed transactions the credit card reader is motorised. It can also detect "hot" cards.

A data well, integral in the terminal, automatically records all details from cordless bar code wands.

As a management information system, using magnetic data cartridges and non-volatile bubble memory, it records what is being sold, when, at what branches and how fast. It calculates, prints results and can show the information on its alphanumeric display; and it records branch level transactions, staff performance and can be coded to identify both operator and sales assistant, should the two

General Automation (CW), Sterling House, 20 Station Road, Gerrards Cross, Bucks SL9 8EW. Tel: (0753) 889112.



The new point-of-sale terminal from Quality Systems International.

PRODUCTS

Telex links to word processor

A FACILITY which enables Puma telex terminals to be linked to word processors or computers is announced by Trend Communications.

A telex message can be typed directly into any word processor, computer or electronic typewriter with V24/RS232C communications interface. It can then be transmitted at up to 300 hits per second into the Puma's memory. Once it is in the memory, a telex operator can add the dialling information and send it over the telex network in the normal way.

Similarly, an incoming message can be transferred from the Puma to the office system by a reversal of the above method. All ITAS characters can be loaded into Puma, but only those with a direct ITA number 2 equivalent can be output to the telex network. An exception is that lower case letters are converted to upper case.

The originator of the telex is able to check the message at source, ensuring that the telex is sent out accurately, thus eliminating errors which might have been introduced through the telex operator re-typing it. This also allows the telex operator to carry out other duties.

A local workstation can be linked to the Puma over a distance of up to one kilometre. Originators of a message may be in departments spread around the organisation or even in different buildings. By using the Puma workstation link, considerable time is saved by removing the need for sending the message by internal mail or hand carrying by the originator, says Trend.

Trend Communications (CW), Knaresborough Estate, Loudwater, High Wycombe, Bucks HP10 9QZ. Tel: (06285) 24977.

Non-glare display

LEAR Siegler's ADM11 display terminal is now available in the UK from Peripheral Hardware.

The unit offers Lear Siegler's Dumb Terminal functions, and costs £540, although dealer and systems house discounts are available.

The ADM11 has a non-glare, green display which tilts and swivels to suit the operator and office lighting. The separate keyboard, with sculptured keys, also tilts.

There are eight programmable functions, an auxiliary RS232 port for a dedicated printer, plus communications speeds of up to 19,200 bits a second.

Peripheral Hardware (CW), Unit 12, Monkpath Industrial Park, Highlands Road, Shirley, West Midlands B90 4NY. Tel: (021) 745 3033.

Colour for Pick users

A WORKSTATION including software and a colour graphics terminal is now available that offers to the 20,000 Pick users the advantages of colour in management graphics, spreadsheets and word processing.

Using the Intecolor 2405 colour terminal and three programs written to take advantage of its colour capabilities, Climax Computer Corp of California has developed a business Color Software A. This is the first of three planned colour software packages.

The Intecolor 2405 provides eight displayable colours and costs \$2,850.

Climax Computer Corp (CW), 22982 La Cadena, Laguna Hills, Calif. 92653. Tel: 714/855-4452.



The 3M Whisper Writer includes the teleprinter, keyboard and acoustic coupler—all in a briefcase.

New communication moves—no louder than a whisper

TELEPRINTER, electronic mailbox or DP terminal, telex access—these are facilities included in one low-cost unit, the 3M Whisper Writer.

The opening up of the communications market following the relaxation of BT's monopoly has allowed 3M to introduce this new development to the UK market.

The 3M Whisper Writer is a desk-top communications terminal, no bigger than a small portable typewriter, with some innovative features.

It is quiet in operation, easier to use than the normal teletype terminal and considerably faster, says 3M. It will sit on an office desk but can easily be carried to almost any location.

It plugs in to a standard telephone jack or can share a line with an existing telephone.

The Whisper Writer is available in a number of configurations. Units can incorporate either an integral V21 modem for direct connection to a telephone line or a standard V24/RS 232 interface for external connection to a hard-wired or acoustic modem.

It is also available packaged in an executive case with an integral acoustic coupler enabling the terminal to deliver instant information from customers' offices, hotel rooms, or anywhere the user has access to a telephone and power. It may be used alone as a receive-only printer or the intelligent keyboard can be added for full communications capability.

Messages may be sent direct from the keyboard or typed into an offline memory, edited and then transmitted. The memory has more than 4,000 characters, about three typed A4 pages.

When used for point-to-point electronic messaging Whisper Writers can communicate with each other or with other compatible terminal units over ordinary telephone lines at 300 words per minute—much faster than voice communication—and five times faster than telex.

The direct phone line connection provides automatic answer and unattended receipt.

3M Business Products Division (CW) 3M House, PO Box 1, Bracknell, Berks. RG12 1JU. Tel: 0344 58473.

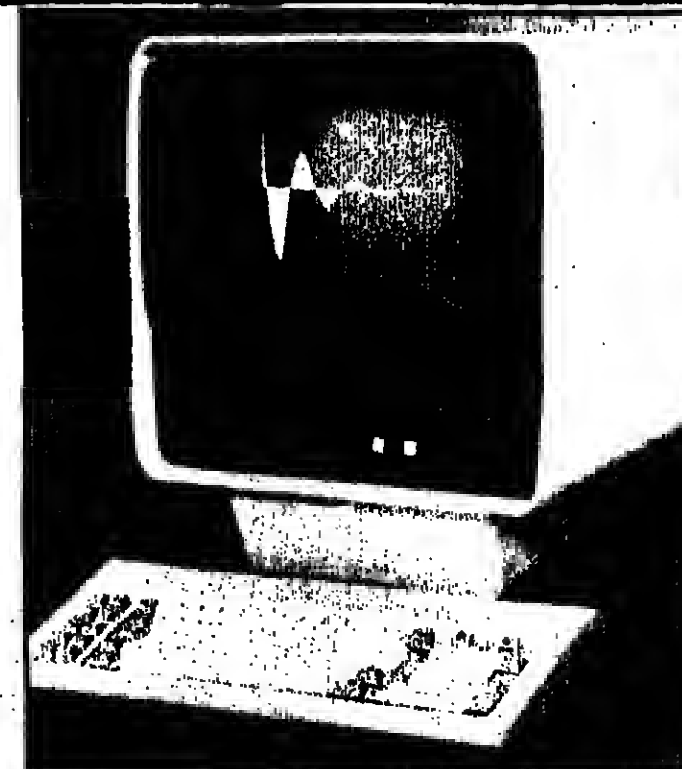
Powerful consultant

THE Elite Consultant is a powerful desk-top system which uses the latest National Semiconductor 16032 microprocessor. It is suited for use as an engineering workstation in areas such as software and hardware development, CAD/CAM and artificial intelligence, says Hi-Tek Distribution.

The Consultant features the 16032 as its CPU, and is based on a series of cards linked via the VME bus. The machine includes 512 Kbyte of memory, which is expandable to 1.75 Mbytes internally or 16 Mbytes externally, and incorporates a removable cartridge disc drive with 5 Mbytes of fixed storage and 5 Mbytes of removable storage. Demand paged virtual memory and multiprocessing capability are incorporated.

Other features of the Elite Consultant include high-resolution graphic capabilities and comprehensive software support.

Hi-Tek Distribution (CW), Trafalgar Way, Bar Hill, Cambridge CB3 8SQ. Tel: (0954) 81931.



The Elite Consultant desk-top system.

Extending computer to the floor

ERICSSON Information Systems has introduced Mimer II, an advanced materials and production control system designed to run on the new System 2500 family of systems.

Mimer II extends the computer to the shop floor by using simple menus and instructions. The user is guided step-by-step through procedures designed for the way the staff work, not the way a com-

puter works. It offers special features, including a "What if?" function, which gives requirements planning and scheduling on different production plans or forecasts; full text facilities within structures and routes; and supplementary functions, such as ABC analysis, calculations of turnover rate, economic order, order point quantities, manufacturing lead times; "follow-up" re-

ports on production quality, rejects and work centre productivity. It is fully integrated with Ericsson's range of accounting packages, providing complete financial and operational control for the firm time within one system, says Ericsson.

Ericsson Information Systems (CW), Swan Office Centre, 1508 Coventry Road, Birmingham B25 8BN. Tel: (021) 707 3050.

Typewriters are used to input text

WORDNET has expanded its product range with a system for Telex users, called TelexNet. It offers a configuration in which up to eight typewriters and/or any terminal keyboard can be used to input text at any one time.

Text typed by the typist is captured on the central processing unit, which can be situated one kilometre from each typewriter. The information can then be retrieved onto the telex terminal where it can be edited prior to being transmitted.

The TelexNet system allows any members of staff the scope to create telexes from their own typewriter keyboard. No special training is required and the input of the telex message is almost immediate, as is the production of "hard copy" of the message, from the typewriter.

Secretarial typing or management staff no longer need to leave their desks to generate telexes, and no longer require the production of punched tape, says WordNet.

The user reaps the benefits of combining word and telex processing procedures. The TelexNet offers powerful editing features including character/line insertion and deletion, word wrap, tabula-

tion and scrolling memory. The text may be prepared in advance before transmission to ensure greater accuracy.

In addition to all the valuable text processing functions TelexNet provides automatic date and time insertion routines as well as control of automatic dialling and recall in the event of a busy line.

A major advantage of the TelexNet service is the improved speed. After a pause of a few seconds the terminal is open to receive text from the communications port or keyboard at the same moment is automatically transmitting stored data. A special split screen facility allows the user to observe messages in the process of generation.

A line display field, showing 14 of the 560 lines, at the bottom of the video screen is allocated for message preparation, while a five-line screen area shows incoming messages, and these may be received simultaneously.

Other special features include automated dial and re-try facilities.

Prices for a basic TelexNet configuration start from £5,710. Wordnet UK (CW), Gillingham House, 38/44 Gillingham Street, London SW1V 1HU. Tel: 01-630 5351.

More user memory in HP personal

RAPID RECALL is now taking orders for the enhanced version of Hewlett-Packard's HP85 personal computer. Known as the HP85B, it provides more user memory as standard, and incorporates Hewlett-Packard's new disc technology.

The electronic disc functions as a high-speed mass storage medium within the HP85B. Comprising 32 Kbytes of solid state memory, the electronic disc emulates a conventional floppy disc drive and is addressed using standard mass storage commands.

Using standard 64K and 128 Kbyte memory modules designed for the HP86 and HP87 personal computers, the electronic disc memory capacity can be expanded to 544 Kbytes.

The electronic disc also provides increased data transfer speeds. Read and write speeds are up to 150 times faster than tape and up to 15 times faster than floppy disc, says Rapid Recall.

Rapid Recall (CW), Rapid House, Denmark Street, High Wycombe, Bucks. HP11 2ER. Tel: (0494) 26271.

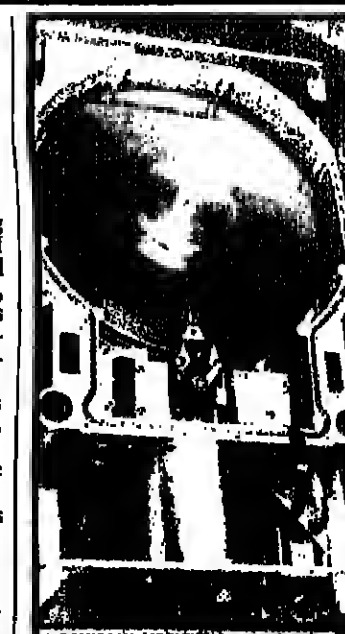
Into printer market

SILVER-REED has entered the personal printer market with two thermal receipt-printers which can be used with either plain paper and a thermal ribbon or thermal paper and no ribbon. Both can also be interfaced to serve as inexpensive printers for most minicomputer systems.

The Silver-Reed EXD15 features a high density 31x24 dot matrix printing head which produces high quality print in a choice of six styles—roman, bold, double density bold, enlarged (double width), automatic underline and shadow.

The Silver-Reed EXD10 will run off a mains or battery power supply, is virtually noiseless in operation and weighs 3kg.

Silver-Reed (CW), 19-23 Exchange Road, Watford WD1 7BB. Tel: (0923) 459976.



The Priam Model 803 8in Winchester drive.

85 Mbyte on Winchester 8in drive

AN 8in Winchester disc drive, Model 803, with an 85 Mbyte storage capacity, is announced by Priam (Europe). The 803 joins the other Priam 8in disc drive family, the 3450 and 7050, which have storage capacities of 35 and 70 Mbyte, respectively.

The 8in series incorporates a fully servoed linear voice-coil positioner for reliable use of the head and discs; a brushless DC spindle motor eliminates the need for belts and pulleys, improves reliability and reduces size and weight; and a proprietary, built-in air-filtering system pressurises the head-disc cavity at critical points.

An on-board microprocessor provides automatic self-test and diagnostics, and proprietary welded steel-rod and sheet metal frame construction promotes cooling while minimizing weight.

Unit price for quantities of 500 units is \$2,575 with the Priam interface, \$2,720 with the SMD interface and \$2,670 with the Ansi interface.

Priam (Europe) (CW), Reading, Berks. Tel: 0734-884788.



The Viewpoint Color VDU.

Colour VDU plug-compatible with monochrome systems

DATA DYNAMICS has announced the ADDs Viewpoint Color VDU which has plug compatibility with ADDs Regent 40/60 and ADDs Viewpoint/60 VDUs.

The 13in screen has a P22 colour phosphor and displays the industry standard 24 lines of 80 characters.

A seven by eight matrix character format is employed which is superimposed on an eight by 10

matrix for true ascenders and descenders. A 25th status line of 80 characters is standard.

The low-glare screen can be tilted through 360 degrees and can be tilted over a 19 degree range to minimise reflections and enhance operator comfort.

There is a choice of eight background and eight foreground colours which can be individually selected from a palette containing

red, green, blue, yellow, cyan, magenta, white and black.

The angle of the separate low-profile keyboard can be adjusted over a 20 degree range to suit the individual operator. Apart from a three-key numeric cluster, a separate editing and cursor control cluster and eight function keys that can be user-programmed to provide 16 separate functions

are provided. The standard interface is RS232C with a 110 to 19.2K baud range. RS422 or 20mA current loop interfaces are available as options.

An auxiliary RS232C printer port can be adjusted independently in speed.

There are a number of data transmission and reception modes including the standard local, conversational and block modes;

plus message, form, set-up and monitor.

The VDU can be supplied in Data Dynamics with a choice of international language character sets which includes character key tops to suit the language used.

Data Dynamics (CW), House, Clayton Road, Middlesbrough. Tel: 01-448 9781.

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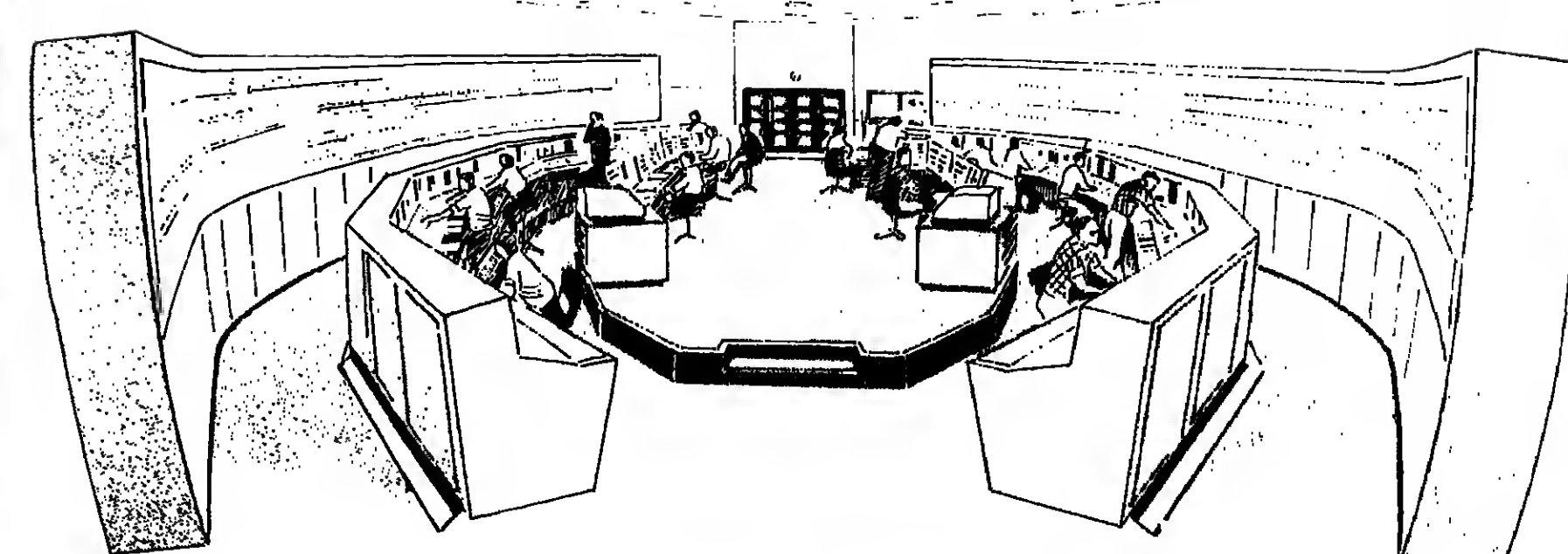
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DPCX 8100	Prog		ASSEMB	Sussex
DPPX	Anal/Progs		COBOL	Various
MVS	Progs + A/Progs	± (IMS ± OB/DC)	COBOL or PL1	South
				Middlesex
MVS	Sys Anal	FCS EPS		Sussex + Berks
OS or DOS	Ps + A/Progs	CICS ± OL1	COBOL	

IBM

OS or DOS	Prog	MANTIS	COBOL	Sussex
OS/DOS	Progs	CICS	PL1	Various
OS/MVS	Anal/Progs	IMS OB/DC	COBOL	Herts
SYSTEM 34	Prog		RPG II	Middlesex
SYSTEM 38	Prog		RPG III	London
	Anal/Progs	DIALOG TSO	COBOL	London
	A/P + Sys Des	RAMIS		Middlesex
	Sys Anal	On-line/DB Experience		Sussex
	A/P or Sys Anal	Acctg Systems		Berks
	Project Leader	Order Proc System		Sussex

OTHER

BURR 1900	Prog + A/Progs	OMS II	COBOL	N East
OEC	Prog	MASCOT	CORAL 66	S Coast
OEC	Anal/Progs		FORTRAN	Surrey
OEC	Anal/Progs		MACRO II/32	Middlesex
OEC	QA Software	MILITARY SYSTEMS		Somerset
DEC VMS	Sysware Prog		MACRO 32	Various
DEC VAX	Analysts	MASCOT	CORAL 66	Dorset
GEC/4000	All Skills		CORAL 66	Herts/Dorset
ICL	Anal/Progs	IMS	COBOL	Middlesex
ICL	Data Anal	DOS		London
ICL 2900	As, Ps + Team Ldr	IMS ± TPMS	COBOL	Various
INTEL 8080	Analysts	MASCOT	PDL	Wills
INTEL 8080	Lecturer		PLM 80	W Country
PRIME	Tech Specialist		COBOL + FORTRAN	London
	Sys Anal	On-line/DB Experience		Sussex

INTERNATIONAL

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SW Engineers		W Germany
All Skills		W Germany

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SENIOR APPOINTMENTS - £14K +

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No matter how successful you are in your present job, there are many reasons why you should consider a move to Hambro Life.

So many, in fact, that we've spelt them out in our Systems booklet:

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If you've been reading the Press over the last few months, you'll know that there's no where more healthy than the financial sector. **And there's no company within that sector growing, diversifying and succeeding faster or better than Hambro Life.**

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All of which means that we need more first-rate Systems professionals to join a team that is second to none.

The job given to you – and the salary it carries – will naturally depend on your experience, ability and potential. We have vacancies at

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£13,000 plus car
(for a minimum of 4 years solid Systems experience) up to

£18,000 plus car.

Because Systems feature so highly in our success, the people we recruit have to be something special.

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Your professional skills are more important to us than the

machines and applications through which they were acquired, and your experience in large-scale systems and record of successful implementations will reflect the qualities we demand.

On top of salary and car, all appointments carry a first-class benefits package including non-contributory pension, profit sharing and share option schemes, free life cover and BUPA – plus generous assistance with moving to this attractive part of the country.

That's Systems at Hambro Life in a nutshell:

But if you'd like the full story, return the coupon. Or call (0793) 46700 (24 hour answer phone).

Please send me a copy of your Systems booklet and an application form.

Name _____

Address _____

Post to: Linda Hobbs, Hambro Life Assurance plc, Hambro Life Centre,
Station Road, Swindon, Wilts. SN1 1EL.



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CITY

Salary c.£25,000
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for a principal company in a leading international financial services group.

Reporting to the overall head of information systems, and controlling substantial staff resources, the appointee will be responsible for all areas of information processing technology, covering operations, message switching, advanced telephone facilities and data networking. The brief is to build and maintain an integrated and coherent technical environment, providing the highest level of user service to a volatile and demanding business sector.

The requirement is for a service orientated, information processing professional with good planning skills and strategic awareness coupled with a relevant portfolio of substantial technical experience. Management ability and the willingness to apply technical skills in a practical manner, are essential ingredients of the position. A hardware background which includes knowledge of DEC equipment would be ideal, and a degree or professional qualification, preferably in engineering, would be a strong additional recommendation.

Please send a CV or write or telephone for a Personal and Professional History Form to JOHN KITCHEN, at the address below, quoting Reference GW1149.

BIS Applied Systems Limited
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London SE1 7UT
Telephone 01-633 0866



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Senior Systems Engineer

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Due to their exceptional growth, they now wish to appoint a Senior Systems Engineer for the United Kingdom, who will be responsible for hardware and software installation, pre-sales site inspections and assist the salesforce in

advising customers of site requirements and ensuring that systems are correctly configured. As this is a key appointment, candidates should preferably have an HNC or an equivalent degree in electronic engineering, be highly professional, hardworking, and self-reliant and be able to solve 'system' problems. You must have at least two years systems maintenance experience, preferably gained on VAX equipment and be familiar with at least one operating system.

Our client, of course, is prepared to reward high calibre professionals and an attractive salary is offered together with a comprehensive benefits package which will include BUPA, Life Insurance, Stock Options and Company Car. This is an exceptional opportunity to join a unique environment where advanced computer technology is driven by an enlightened and young management team.



For a complete confidential discussion
contact Richard Champion on 021-236 1999
(24 hour answering service) or 0562 884166
evenings and weekends. Alternatively
submit a detailed curriculum vitae to the
Birmingham office.

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Telephone: 0602 580935

Or Derek Wadham at:
Thatcham (0635) 66923.

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CAP

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- ★ Applications consultancy and design of embedded systems

- ★ Technical consultancy in database, distributed systems, system architecture and defence systems

Successful candidates will have the drive and ability to push forward the state of the art in advanced computer applications. Abingdon is situated in open countryside close to Oxford. The Centre has extensive in-house computing facilities and offers a lively multidisciplinary working environment.

If you think you have the necessary qualifications, please call us for an application form, or send an up-to-date CV to:

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SPL International Research Centre
The Charter
Abingdon
Oxon OX14 3LZ
Tel: 0235-241132

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Midas touch for job-seekers

Plenty of good jobs wait to be filled, but finance companies are looking for the best says John Kavanagh

MONEY talks, so they say — and just now it is saying some attractive things to computing staff. For much of the finance industry — banks, building societies, insurance firms and other financial institutions — is going through a period of technological change which offers some rewarding challenges to ambitious people.

Add to this perks such as cheap mortgages, plus the demand from top consultancies for people with finance industry experience, and suddenly the idea of a job with a bank or building society does not seem so staid after all.

The finance business is now an exciting one to be in for computing people. Banks and building societies in particular have found themselves competing head-on in the last couple of years as banks have muscled in on the home loans market and building societies have started offering more current account facilities, including cheque books in some cases.

This battle has a big prize at the end: the general public's money. For the British are the great unbanked. About half the working population is still paid in cash, compared with 1% in the US, 2% in France and 5% in Germany.

Banks say companies can save £25 per employee by getting them to take monthly payments through a bank account instead of weekly cash pay packets.

The pay of half the people with jobs is quite a sum, and worth fighting for. And one of the main weapons the finance industry is using is high technology.

Building societies are considering installing self-service auto-teller machines to offer the same round-the-clock withdrawal facilities as banks, plus services such as cash deposits and enquiries through the same terminals.

The societies have gone a long way in discussing a nationwide network giving any investor access to his building society account through any other society's auto-teller machines. Banks have already made progress in this area, with the main banks getting together in consortia to offer similar joint facilities.

Such moves as these add up to some challenging development work in both communications and mainframe applications. Meanwhile other development areas are coming back to life this year after a freezing of new work when the recession started to bite.

"There's been quite a lull, but things are definitely picking up now," said Simon Koning, senior consultant at Targa Computer Recruitment's City office.

A lot of insurance and banking companies have fallen back in development and they are now realising they must do something about it. They recognise that a good DP

set-up can drive a company along.

"There are some big shake-ups going on. Some companies in the finance industry are looking for complete teams of people. One big US firm is recruiting 60 people, from data prep staff to systems analysts."

These comments were borne out by two leading insurance firms, which preferred not to be named. Both were starting to look for staff

There are some big shake-ups going on. Some companies in the finance industry are looking for complete teams of people. One big US firm is recruiting 60 people, from data prep staff to systems analysts.

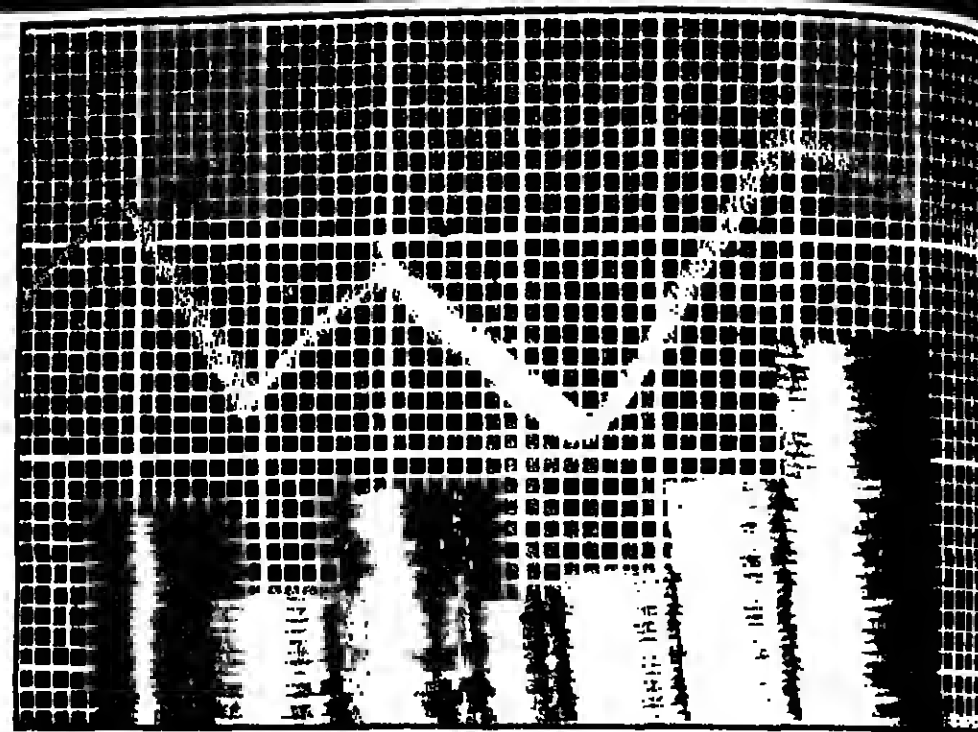
again this year after a recruitment freeze.

"We're expanding our DP development area because we have a long list of big things to do, especially in online systems," said one company.

Koning said there were plenty of good jobs around, but finance companies tended to want the best people.

"Once you're in banking or insurance and have got a good grounding it's easy to move around, but it can be difficult to get in if you're coming from the commercial world," he said.

One of the insurance companies



"The sky is the limit for the ambitious person in banking."

If interesting development work is an attraction for computing people considering the finance industry, job security and perks are the other incentives.

Jennifer Lees, careers officer at the Chartered Insurance Institute, said perks varied, but cheap mortgages were becoming common. Insurance firms were offering mortgages at interest rates of between 5% and 7% she said. Other perks included flexible hours and lunchtime vouchers or canteens.

Koning at Targa added good salaries to this list. He said some companies gave mortgage subsidies as cash in hand. This could amount to between £1,500 and as much as £2,000.

He pointed out that perks such as these were not only an attraction for new staff — they were also a reason why established staff did not leave.

As he put it: "Banks and insurance companies and so on all

precipitate good staff and do their best to keep them."

By no means all the jobs are committing into London. Just the programmer, analyst or operator seeking a job in the finance world can choose between capital and any one of a long number of pleasant parts of the country. Many companies in the industry moved their administrative and computing centres from London in the mid- and late Seventies. They were not so strained by a need to move to industrial centres, so they picked more choice spots in the country or on the coast.

"With some finance backgrounds you can go in a direction you want," said Koning. "For example the top computer and management consultants are crying out for people with banking experience."

No message from the finance industry is that you have to good to get in.

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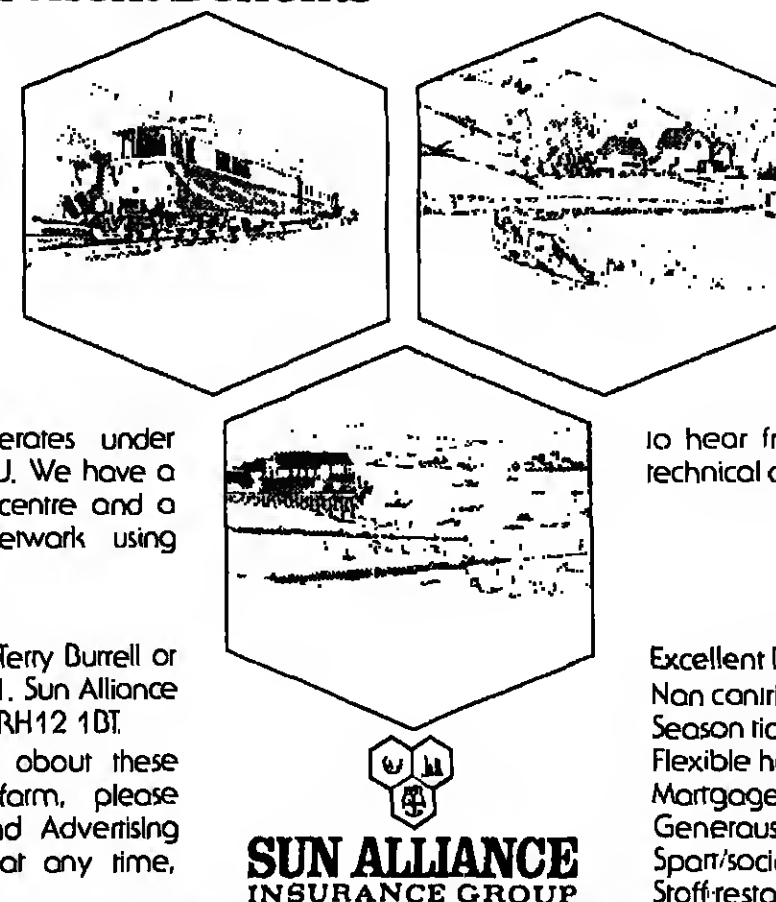
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Sun Alliance is one of the UK's leading insurance groups with sophisticated computing facilities occupying two linked computer centres. Our configuration which is already one of the largest and most sophisticated in Europe includes an IBM 3081 operating under MVS SP1.3 supporting an expanding 800+ terminal network using IMS as its DB/DC system. Program testing operates under VM/CMS on a 16 megabyte IBM 3033U. We have a linked IBM 3032 at our Birmingham centre and a developing distributed processing network using multiple IBM 8100's.

ACTION

For an informal discussion, please ring Terry Durrell or John Gulgoly on Horsham (0403) 64141. Sun Alliance Insurance Group, North Street, Horsham RH12 1DT.

For a detailed information package about these appointments and an application form, please telephone the HAY-MSL Selection and Advertising Answerphone Service on 01-629 1844 at any time, quoting ref: QEU/146.



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Central to our applications software development is the use we make of IBM's database management system IMS - for example we have a network of logically related databases consisting of over 70 million segments. (Our IBM 3081 runs with 3380 discs using Xerox laser printers.)

But Programming at Hambro Life is also different because the company's different. Not content with its position as the country's largest unit-linked life company and one of the top 100 companies in the U.K., it is now embarking on a programme of

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Starting salary will naturally depend on your experience, ability and potential. In addition, our first-

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Please send me your Programming booklet and an application form.

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Post to: Linda Hobbs, Hambro Life Assurance plc, Hambro Life Centre, Swindon, Wilts. SN1 1EL.



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Computer Programmer PL/1 and/or RPG11

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Salary is negotiable according to experience. Please write to: Company Personnel Manager E Gomme Limited, Spring Gardens High Wycombe, Bucks. (0693)



The UK Consumer Products Division of the Wilkinson Sword Group, manufactures and markets a diverse range of high quality products covering the traditional shaving implements, garden tools and scissors. Together with Bryant and May matches and lighters and the Kitchen Devil housewares range.

We are actively involved in the implementation of sophisticated on-line systems operating at remote sites using terminals and IBM PCs for central and distributed systems. Group hardware is centred around the IBM 4341 under MVS and CICS and networking facilities form an integral part of our development plan.

To maintain our ambitious schedule, we now need some keen men and women who can make an immediate and positive contribution to the implementation of new order processing, sales, manufacturing and financial system applications throughout the Division.

Analyst/Programmer £8,000-£10,000

You should be a capable COBOL Programmer with some analytical experience, or have the desire to develop your career in this direction. Experience of MVS, CICS and VSAM would be useful and you must possess the necessary personality and drive to work successfully within a small team involved closely with business users. Appropriate training will be provided as required.

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Keen, young Blades

...for advanced on-line systems development

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**WILKINSON
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(5674)

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(8MB IBM 4341)

To £11,500

North West

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Opportunities exist for Systems Programmers with in depth involvement in systems generation and for Software Programmers with experience of significant software development. Applicants, qualified to degree level, will have at least 3 years relevant experience gained in a VM/VS(E) environment with exposure to TP and Data Base. Previous supervisory experience would be an asset. Employment conditions and benefits are those expected of a major company. Relocation expenses will be paid where appropriate.

Write enclosing full CV to H L Williams
PER, 3rd Floor, Graeme House,
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Applications are invited from either sex.

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LONDON SW6 up to £13,412

The British Gas London Computing Centre is a purpose-built modern building in Fulham. It provides British Gas with a commercial and scientific computing facility and houses the various development and support sections. Current hardware comprises an ICL 2972 mainframe, DRS distributed systems and various smaller systems. There is also a Univac 1100/61 mainframe computer system.

Expansion of the Computer Services and Systems Development Department has created a vacancy for an analyst/programmer to work in the areas of implementation and development.

The person appointed will liaise with systems development staff from the earliest stages of application design and development up to implementation and production of automated job control, security and recovery procedures. This is an ideal opportunity for someone who is fully aware of the latest developments in software techniques to move from commercial applications to a more technical environment.

Applicants, male or female, should have between 1 and 3 years experience of commercial data processing on ICL VME/B (or VME 2900) machines. Appropriate training will be provided.

Salary will be in the range £10,924-£13,412 (including Inner London Weighing). Benefits are those normally associated with a large progressive organisation.

Please write, with full personal and career details, quoting reference EP/764007/CW, to: Assistant Personnel Manager (HQ Services), British Gas, 59 Brynston Street, London W1A 2AZ.

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Those who think they can match up to our demanding standards should send full details, including performance achievements to:

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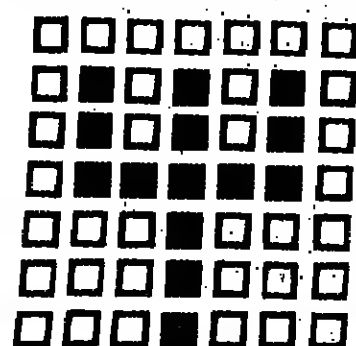
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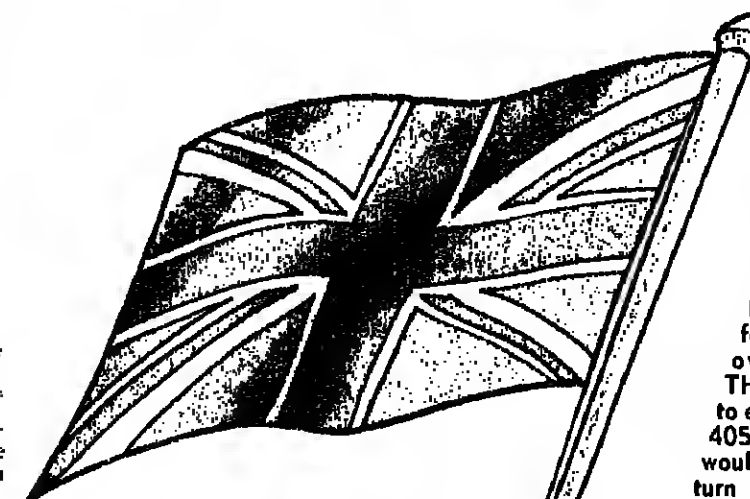
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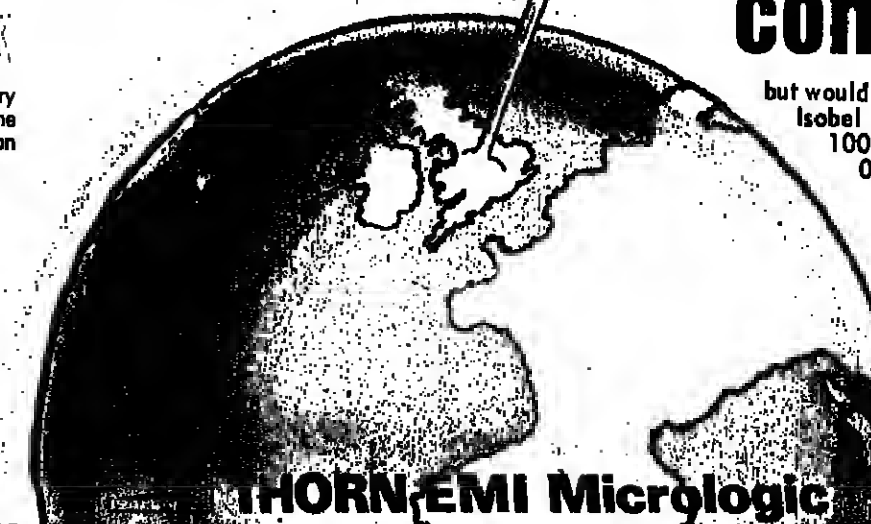
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3M

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IBM 3083 – MVS/JES2, TSO/SPF, CICS and IDMS

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c.£15,000+
Applicants must be able to demonstrate a sound technical track record of design and implementation of large-scale batch and online database applications, with experience of IDMS or other database experience. A working knowledge of command level CICS is essential for one of the positions preferably gained in an OS/MVS/JES database environment. A knowledge of BAL would be an advantage, but not essential. Project Leaders are responsible for functioning systems and associated documentation.

DATABASE ANALYST

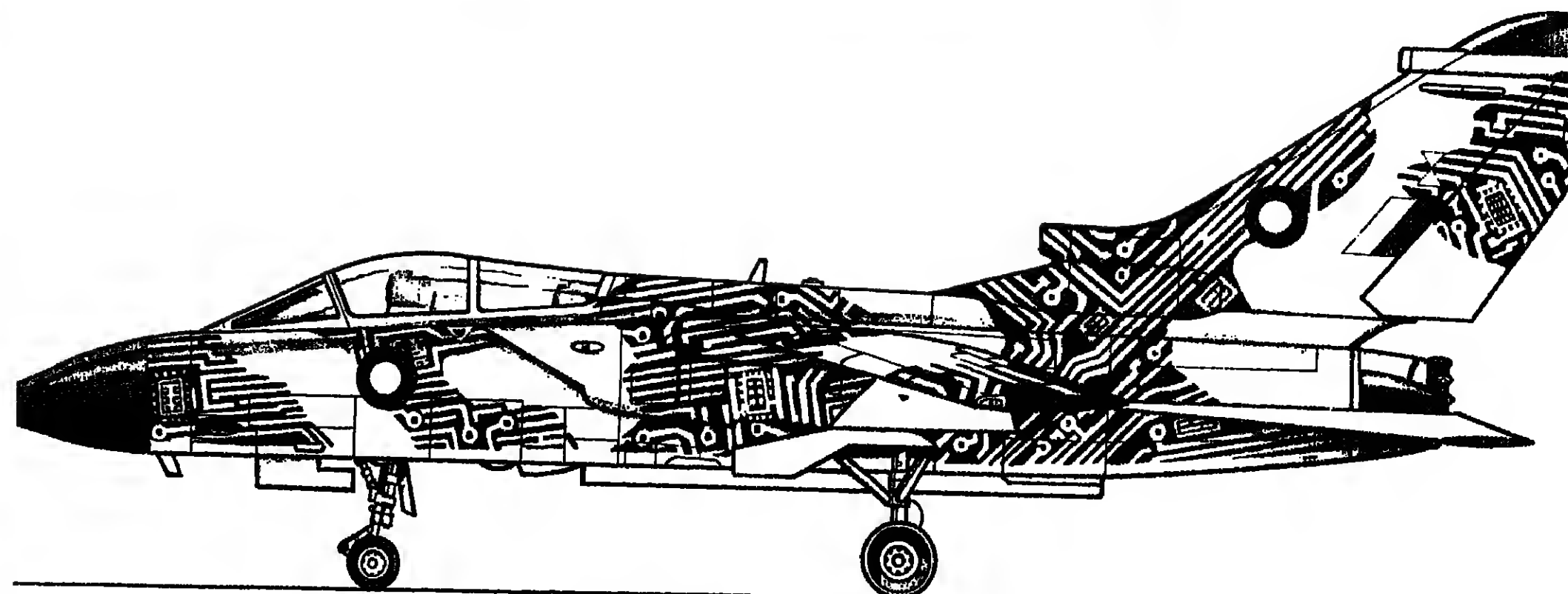
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This position will suit someone with a sound knowledge of IDMS (IBM or ICL), together with a working knowledge of COBOL. The successful applicant, who will be responsible to the Database Administrator, must be able to communicate effectively at Project Manager level, and make database design decisions. Additional functions would eventually include responsibilities for staff at junior level.

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SYSTEMS SOFTWARE SUPPORT UK/ABROAD £20,000+
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O.B. ANALYST X2 MIDOX/LONDON to £15,000+
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Ref. B: 01-784 6937
Ref. C: 01-942 1178
Ref. D: 01-310 0482

H.P. 3000 PROGRAMMER/ANALYST SURREY £13,000 + Bonus
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NCR PROGRAMMERS AND ANALYSTS to £13,000 + Mortgage
Leading Banking organisation, based in London, needs programmers with a minimum of two years' COBOL experience on the development of online financial systems in an NCR R250/R555 environment. Two Systems Analysts with banking or other financial experience are also needed to develop major new applications. A programming background would be useful but not essential. Ref: C108

FORTRAN SPECIALISTS to £12,500 + Bonus + Relocation
Programmers and Analysts/Programmers are urgently needed in the London/Home and Southern Counties to join existing development teams, working on a wide variety of application areas, i.e. scientific, research, engineering and commercial applications using mainframes and minis, e.g. IBM, DEC, HEWLETT PACKARD, DATA GENERAL etc. Excellent prospects and benefits include BONUS schemes, BUPA and RELOCATION, where necessary. Ref: C391

RPG 3 PROGRAMMER MIDOX c. £11,500
Ideally the successful applicant will have a minimum of 12 months' RPG 3 experience to work on a variety of projects within the Software House division of a large manufacturing organisation. Ref: B69

PASCAL PROGRAMMER LONDON to £11,500
A well-known telecommunications organisation requires someone with two years' PASCAL experience primarily gained on DEC/VAX equipment. The successful candidate will be involved in the development of new and enhancement of existing systems. Excellent career prospects and benefits apply. Ref: D704

ASSEMBLER PROGRAMMER N. SURREY £10,000+
Our client, a leading financial organisation requires programmers with at least two years' IBM ASSEMBLER experience preferably with a working knowledge of CICS, to meet their demands for new extensive development projects. Ref: B88

JUNIOR RPG 2 PROGRAMMERS (TRAIN IN RPG 3) HERTS c. £10,000
A leading manufacturing organisation requires Programmers with a minimum of 12 months' RPG 2/3 system experience to train on their recently installed System 38 using RPG 3. Successful applicants will be part of a team developing new financial and manufacturing applications for the company's European network. Very fringe benefits together with extensive European travel are offered. Ref: A48

COBOL PROGRAMMER W. COUNTRY c. £9,000 + Relocation
Our client, a leading name in the retail industry is seeking to recruit someone with two years' COBOL experience to develop commercial applications on their ICL 2978 using VME/8. A structured career path together with large company benefits are offered. Ref: A1013

IBM OPERATOR (OAYS ONLY) LONDON c. £8,000
Our client, a leading manufacturing organisation, requires someone with sound DOS/VS2 CICS experience to solely supervise their 4341. A working knowledge of systems programming is highly desirable. Ref: B1010

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with four years' experience in message switching, communications networks and EFT, or alternatively good mini/micro real-time programming.

Programmers to £10,000
with at least two years' experience in real-time systems, ideally including message switching, communications networks and EFT.

To apply your knowledge in a market sector dependant on the latest technology, please call Jennifer Williams on 01-636 5454 or write to her at Logica Limited, 64 Newman Street, London W1 (quoting ref: FG/12).

logica

your appointments register

Programmers

NCR/IBM/COBOL to £15K
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Commercial H. Counties - Midlands - ManchesterDEC/PDP 1170 to £11K
COBOL SurreyASSEMBLER ON POPULAR
MICROS to £35k + Royalties
Games Writers & Designers
London/Slough/LiverpoolIBM/MVS to £15K
IMS/CICS/DL1 MidxSYSTEMS 34/36/38/RPG2 to £12K
Insurance/Commercial London/Home CountiesIBM to £16K
System exp. EssexBASIC to £15K
Mini/Micro Computers LondonIBM/UNIVAC/COBOL to £12K
On-line/Database SurreyVAX & IBM SYSTEMS to £11K
Fortran MVS/TSO South Yorks.

Analyst/Progs

PRIME CAD/CAM to £11K
Home Counties/E. AngliaIBM 34/38/4341 to £15K
London/Home Counties/NortICL 1500/ME29/2903 to £12½K
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Our client is a computer services company within a well-known group, which is currently expanding to take on more development work. Group benefits include a good pension scheme and profit sharing/productivity bonus. They have a variety of hardware, which includes IBM GSD equipment, DEC (PDP-11 and VAX) and micro-computers. Experience gained in a commercial environment (accounting, payroll, personnel records) or manufacturing/production control, would be of particular interest. The systems to be developed will be both on-line and batch. In addition, you will be given the

IBM—GSD

- RPG II
- RPG III
- COBOL

opportunity to broaden your experience by implementing micro-based packages. As a senior programmer, you will already have had at least 3 years' programming experience including, ideally some supervisory experience, as you will be responsible for the technical supervision of programmers. An additional requirement will be the ability to communicate with non-technical users. Please contact Joan Ainsworth on 01-681 8311 or write to her at Computer Search & Selection, 6th Floor, Canlyn House, Dingwall Road, Croydon, Surrey CR0 9XE.

DEC

- PDP-11
- VAX
- COBOL

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LIMITEDAnalyst/Programmer c. £10,500 p.a.
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ICLME29 COBOL
LOCATION: WORCESTERThe Company:
Dolphin Showers is an expanding company in the home improvements market. We are part of Kean & Scott Holdings Ltd, which includes Alpine Double Glazing Ltd. and Sherr Bedroom Designs Ltd. Kean & Scott is a member of the Hawley Group of Companies.The Equipment:
ICL ME29 Model 37 currently running under MTS with Cobol.The Requirement:
We are seeking to employ an analyst programmer and a programmer who will form the nucleus of a new data processing department, this function having previously been carried out at group headquarters. Experience of ICL/Cobol in an on-line transaction processing environment is considered essential. Ideally candidates should also have had some ME29 operating experience.The Career:
The positions are demanding ones offering both the opportunity of being in at the start of a new department and considerable responsibility to the successful candidates. Several major development projects are in progress and we are committed to the introduction of data processing in most aspects of the Company's business.The Rewards:
As well as highly competitive salaries we offer a range of excellent benefits including pension scheme, life assurance, discount on Group products and, if necessary, assistance with relocation expenses.

Interested? Then please contact either Chris Morrow or Deborah Hallett of Total Selection who have been retained to advise on this appointment.

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Our client is a major subsidiary of a leading financial services organisation with a worldwide network of offices. The dramatic growth which has taken place in recent years has led to the installation of a large and very sophisticated multi-CPU mini computer system to handle the high volume of daily transactions. Plans have been approved to extend the use of data communications facilities and another powerful mini computer will be installed to handle a variety of other business activities. Application software development is handled by a Systems House.

Candidates must have in-depth experience of transaction processing installations and be sufficiently familiar with operating systems software to pin-point problem areas and to brief technical support personnel. Knowledge of the products of leading

mini manufacturers such as DEC, HP, TI, Honeywell or DG is important and familiarity with data communications equipment and techniques would be advantageous.

The achievement of a high quality of service to the user department is paramount and accordingly a sense of urgency and willingness to 'roll up ones sleeves' are vital.

Salary is negotiable and is unlikely to be a limiting factor. The successful candidate will have the opportunity to implement state of the art techniques and will be expected to influence future D.P. developments.

In the first instance contact Bruce Crammond (quoting Ref. 411) on 01-631 4184 or write to him at: A&A Consultants (Holding) Ltd., County House, 10 Little Portland Street, London W1N 5DF.

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The person we are looking for will:

- help identify documentation requirements in relation to products and market needs;
- plan, implement, and progress the production of technical publications (using both in-house and external resources);
- ensure adherence to high standards of house style, quality, content, and accuracy;
- plan resources (manpower, time-scales, and budgets) for large, complex projects;
- ensure that reviews and field trials are carried out and followed up;

- contribute to the writing of individual publications as necessary;
- if possible, have the following qualifications:
- a degree;
- several years experience in user documentation in a relevant field - including specific experience in the computer industry;
- experience of both the writing and production of technical publications;
- the ability to lead a small team and liaise effectively with outside contractors, agencies, and other suppliers.

We offer a particularly attractive range of benefits including good salary; 25 days holiday free BUPA life and disability insurance; pension scheme; and generous help with relocation expenses. If you are interested in this vacancy please contact Polly Keane, on Oxford (0865) 726136 or by letter, for an application form, quoting reference: TPI/CW9.

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BENSON PLOTTER OPERATOR/SUPERVISOR	Graphics
ANALYST PROGRAMMERS	PL1 TSO preferably SPF to work on development projects structured techniques.

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CONTRACT UK

POSITION	LOCATION	NO. MONTHS
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COBOL PROGRAMMERS IMS DB/DC	MANY	6+
VM SYSTEMS PROGRAMMERS	S. LONDON	6+
DPS6 ANAL/PROGRAMMERS	W. LONDON	NEG
U 1100 PROGRAMMERS JSP	SOUTH-WEST	3-6
DIGICO PROGRAMMERS/DESIGNERS ASSEMBLER	HERTS	18
RPG III PROGRAMMERS	SEVERAL	3-12
PSCAL PROGRAMMERS REALTIME	BUCKS	4+
SERIES 1 PROGRAMMER/DESIGNER ASSEMBLER RPS	CENTRAL LONDON	6+
SENIOR DESIGNER IMS DB/DC	CENTRAL LONDON	6+
ICC ANALYSTS	CENTRAL LONDON	6-24

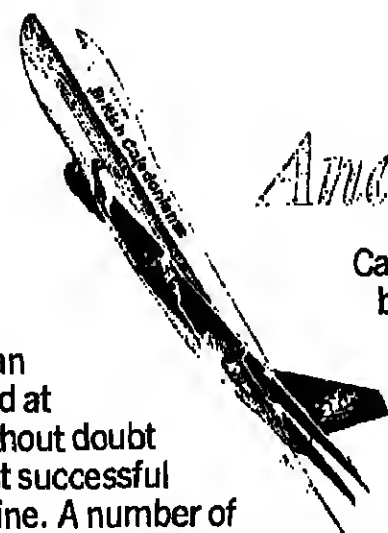
Call Keith Duncan on (0892) 44757 or (0892) 66545 (up till 10 p.m. evenings weekends) alternatively write to:

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(1789)

Analyst Programmers/Programmers

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Analyst Programmers (Ref: 407)

Candidates will need about 2 years' systems involvement and possess a COBOL background in an IBM environment.

British Caledonian Airways are based at Gatwick, and without doubt are Britain's most successful independent airline. A number of Analyst/Programmers and Programmers are required to join them in the development of important new systems.

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Using dual IBM 4341 mainframes plus significant other hardware, British Caledonian has developed a highly technically competent installation. All the vacancies are new and stem from Senior Management's desire to see rapid growth in the use of computing.

Programmers (Ref: 408)

The requirement here is at least 18 months' experience, ideally using COBOL in an IBM environment. Applicants will be technically sound and anxious to progress.

The rewards in terms of job satisfaction and salary are excellent. These, coupled with the benefits one would expect from one of the world's major airlines, makes this a very exciting opportunity. If you are interested, either write, telephone, or **BETTER STILL CALL IN PERSONALLY TO:-**

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If you are interested, please write to Helen Grace, or phone her for an application form (quoting ref. PTY 1) at Logica Limited, 61 Newman Street, London W1A 4SE. Telephone 01-638 5454.

COMPUTER GRAPHICS

The production of computer animation to meet tight deadlines for BBC Television programmes presents many interesting problems and offers creative and technical challenges to those involved in software development within the BBC Computer Graphics Workshop. Due to expansion and internal promotion within the Workshop several new Analyst/Programmer and Programmer posts have been created. Experienced programmers are required to work closely with designers and production staff at BBC Television Centre, London.

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Analyst/Programmer (Ref. 3643/CW) Salary £9,196 - £11,167 plus allowance of £511 p.a.

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Contact us immediately for application form (quote relevant ref. and enclose s.a.e.): BBC Appointments, London, W1A 1AA. Tel. 01-580 3334.

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(1606)

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All replies will be treated in strict confidence.

For further details, please contact Barry Turton on (0270) 627206 weekdays, or Alsager (08363) 4743 during evenings and weekends, or write to him at the address below.



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to £13,000

- RPG II
- RPG III
- COBOL

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1984 sees the installation of a System/38 and full support and training will be given to help you become an experienced and seasoned professional. You will need to be self motivated and able to work without supervision. Leadership qualities would be an advantage as opportunity for progression is excellent.

Please telephone for an early informal discussion our Advising Consultant, Richard Milsum, on 01-354 1055 during office hours or on 01-958 2553 in the evenings or weekends. Alternatively please send full details to him at:

MARCH 1 NOEL ROAD, LONDON N1 8HQ
COMPUTER 01-354 1055
RECRUITMENT

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ICL professionals with experience of IDMS, DDS, REPORTMASTER, QUERYMASTER. Six years' programming experience with at least two as a team leader to take the initiative within this new ICL installation. Degree or professional qualification preferred. XF2Y

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Extensive UNIVAC 1100 series experience. If you have the necessary skills this new UNIVAC installation can offer you the sort of challenge to progress your career. Attractive company benefits for the successful applicant. XF3Y

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A vacancy exists for an experienced analyst/programmer with a strong background in COBOL programming to work on a variety of projects. Candidates must show an ability to work largely unsupervised in a role in which there is plenty of user contact. J.7831

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COBOL, UNIX, Programmer/Analysts LONDON
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The Fraser Williams Group is one of the country's foremost Computer Services organisations providing extensive project oriented DP services to commerce and industry.

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The successful candidates will be responsible for enhancements to existing packages, installation of systems at client sites and the tailoring of software.

This is a unique opportunity within an expanding organisation offering plenty of travel and considerable client contact. If you have at least one years' HP3000 COBOL experience together with IMAGE AND VIEW then please contact:



For further details and an application form

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This highly challenging position offers the opportunity for a move into Junior Management and will secure you a career in International Financial Data Processing.

For more information and an informal discussion, telephone MARTIN BARRY on (01) 253 5042. Alternatively write to him at the address below, enclosing an up-to-date and comprehensive C.V.

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North West

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in customer liaison with a manufacturer/vendor and recognisable and identifiable expertise in DDP/WP products.

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For further information contact our Advising Consultant, **JOHN WHELAN**, on 061 833 0427 (Telephone Answering Service) or 0625 520708 (Evenings and Weekends before 9 p.m.)

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Salaries range from £8K to £20K depending upon seniority of the position. Benefits generally include BUPA, Life Assurance and relocation expenses.
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Senior Programmers City to £13,000
My company, a multinational organisation, seeks personnel with a minimum of 2 years experience to supervise small programming teams. Experience of DEC PDP and VAX range, RSX-11M, VMS, with knowledge of high level languages is required. A background in communications networks is desirable.
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To satisfy the increasing demands for our services, we are now seeking to appoint two self-motivated individuals within our Data Processing Division. Your responsibilities will be varied, including establishing and maintaining firm client bases, advising on different methods of recruitment, the planning and management of advertising and search assignments and the marketing of selected people to new and existing clients. Ideally in your mid to late twenties you must have:

- either a provable record of success as a Recruitment Consultant in the Data Processing sector
- or a sound background in data processing with a desire to move into a selling environment
- plus energy, ambition and determination coupled with good interpersonal and organisational ability

Remuneration - the people we are seeking will be disappointed (and so will we!) if they earn less than £14,000 during their first year. A very attractive package, based on performance, enables a successful consultant to earn in excess of £25,000.

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IBM OPPORTUNITIES

IBM COBOL To £10,000 + Mort.

Super opportunity to get into the world of finance. This London based international bank recruits a Programmer with two years' IBM experience, preferably with DOS/VSE, to work on a range of database projects using DL/I, CICS and/or PL/I experience would help, but more essential is the ability to fit into a small team environment, where you are encouraged to use your initiative. Full range of banking benefits including subsidised mortgage. REF: CW/2801.

PROJECT MANAGER PROGRAMMER MIDDLESEX £13,500 (+ car) To £11,000

This company is well known world wide for the service it provides. The installation comprises of an IBM 4341, under DOS/VSE with CICS, and the requirement is for a Programmer with two years' IBM DOS/VSE COBOL, and possibly knowledge of CICS and/or Basic, who is capable of user liaison, and moving more towards analysis. The Project Manager should have experience of leading a major project from design through to implementation, and have extensive user liaison experience. Knowledge of IBM Systems would be advantageous but not essential. Benefits include BUPA, pension and life insurance and company car at the senior level. REF: CW/2826.

IBM ASSEMBLER CITY £7-13,000

My client is an established financial services group utilising IBM 4341s under DOS/VSE with CICS. They require a Junior Analyst/Programmer and a Senior Analyst/Programmer to develop and maintain a range of online financial systems, including stock shares, 12 months' IBM ASSEMBLER, required at junior level, and three years' IBM ASSEMBLER with DOS/VSE and CICS at senior level. This is a friendly and energetic team environment, where by using your initiative, technical and personal skills, your future career prospects are excellent. REF: CW/2822.

IBM MVS COBOL CITY £8-12,000

Due to continued expansion, my client is seeking two additional Programmers and one senior. To join this IBM 4341/390 installation you should have 18 months' IBM COBOL with DOS/VSE or MVS, and some online experience, and at senior level a minimum of three years' IBM MVS COBOL, and a reasonable amount towards user experience. CICS online training can be provided and there are a wide range of exciting development projects underway. Benefits include five weeks' holiday, sports and social club, annual bonus. REF: CW/2610.

SYSTEMS PROGRAMMERS/ALL LEVELS To £14,000

Two many positions to lead? If you can offer 18 months' IBM systems programming experience with DOS/VSE, VM/CMS or MVS and any knowledge of CICS, V/FAM, VSAM, MCP, ACE, these positions throughout London and the Home Counties are senior level. Also junior with 12 months' IBM ASSEMBLER experience. REF: CW/GLM.

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IBM COBOL HERTS £8-10,000

This highly respectable multinational company are seeking an Analyst/Programmer to complete their development team. You will have an industrial background and some experience in systems development. This is an ideal opportunity for a young and dynamic personality to come to the forefront. The successful applicant will have two years' IBM COBOL, MVS experience and will be rewarded with an excellent salary and career prospects with a full range of company benefits. REF: EW/2800.

PROGRAMMERS KENT To £9,500

Would you like to work within a small project team involving high degree of interest? Involvement will include a wide range of development application and support work. If you can offer a minimum of 18 months' IBM COBOL experience in an OS/VSE, VM/CMS and IMS or any knowledge of on-line systems, then call for more details. REF: EW/2779.

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PROGRAMMERS BERKS & MIDDLESEX To £13,000 (+ car)

There are many new positions now available in Berkshire, West London and Middlesex for ambitious programmers wishing to increase their skills. My clients require 18 months' IBM COBOL under MVS or DOS/VSE in a commercial environment. You will be working in a development capacity, utilising CICS, DL/I or IMS database in the retail, manufacturing or transport industry. REF: CW/2440/6.

ANALYST/PROGRAMMERS ESSEX £8-10,500

My client, a highly respected manufacturing company are seeking a number of Analyst/Programmers to join a major development project. You will be involved in a sales and marketing system. Two years' IBM COBOL is essential preferably within a DOS/VSE, CICS or other on-line environment. Full range of benefits associated with a major company including staff discounts. Training in CICS will be provided where applicable. REF: EW/2737.

PROGRAMMERS CITY £8-11,000

If you consider yourself to be an above average COBOL Programmer with at least two years' experience, on an IBM mainframe with a knowledge of DOS/VSE, MVS or VM/CMS, coupled with CICS and/or DL/I, any client would be interested in knowing about you. They offer an excellent career path for self-motivated individuals with the opportunity to move into analysis if desired. Benefits and salary are those associated with a large City organisation. REF: EW/3202.

ANALYST/PROGRAMMER CITY To £11,000

An established international organisation based in the City have a number of superb Analyst/Programmer vacancies for up and coming D.P. professionals. You should either have a solid IBM COBOL background and have been involved in commercial work, or have a knowledge of design and/or graphics work. You will be working on an IBM 4341/390 IMS/CICS environment for which training can be provided. Excellent career prospects. REF: EW/2821.

OTHERS

ICL COBOL KENT To £11,000

Kenilworth ICL 2960 installation is currently recruiting for ICL COBOL, skills at various levels. 18 months' + sales experience, preferably with DME/GH is required for the programming positions. The most senior applicants will have proven systems experience, and a solid COBOL background, and would be encouraged to move into analysis, by writing their own specifications for interesting development projects mainly of a commercial nature. REF: DW/2837/8.

PRIME FORTRAN LONDON £13,000

My client is among the most successful in the engineering field and due to expansion is looking to recruit two Analyst/Programmers. The requirements are at least three years' FORTRAN and a sound knowledge of Prime. In addition some COBOL, BASIC or INEO experience would be welcome. This is a really superb opportunity to utilize your skills and step away from a straight Analyst/Programmer job into an extremely interesting position which will include Manager Support and the responsibility of making your own decisions and meeting deadlines. Applications are essential of a linking and personal nature, and the company is currently meeting one or more of many linked to the Prime. As there could be some foreign travel involved a fluency in a European language would be an asset. For further details of this position contact us. REF: MW/3821.

SYSTEMS DESIGNER MIDDLESEX £12,000 +

The best position will appeal to Systems Programmers who would welcome the opportunity to be at the start of this company's exciting new project linked to the build up and travel business. In addition to your sound FORTRAN experience, a knowledge of Parkin Planer equipment and some database would be welcome plus, sound analysis background. Initially you will be working with a small team and every opportunity for advancement will be available as the company expands. Your involvement will be required in developing applications software for online reservations and on-line transaction processing. Also your advice to clients with users and suppliers will be fully utilized. REF: MW/2833.

ANY COBOL £10,000

An opportunity has arisen for two Programmer/Analysts with a prosperous multinational organisation based in North London. They require a minimum of 18 months' recent experience using any structured COBOL, a knowledge of the UNIVAC 1100 under REX/PC 8 being especially welcome. Just one of the many benefits in joining this company is the first-class career prospects and training. If you are educated preferably to graduate level and you are now looking for career advancement within a professional environment they promise an excellent starting salary and all large company benefits. REF: MW/2744.

DATABASE PROGRAMMERS KENT/ESSEX £11,000

Candidates must have a thorough knowledge of Database techniques together with at least 18 months' recent exposure to COBOL. Some UNIVAC 1100 or Burroughs experience would not be essential though not essential. The nature of the work will be all development and online and the successful candidates will be expected to assist in the design of future database as well as getting involved with user liaison and providing help and advice to junior staff. An excellent opportunity for an enterprising person looking to expand his career. REF: MW/2831.

DEC-COBOL/BASIC + ENIG My client, a leading leisure company, seeks an Analyst/Programmer with an outgoing personality who enjoys using information and problem solving. You must have a minimum of two years' DEC COBOL and/or BASIC +

experience. Based in Herts, you will be developing new systems from feasibility study through coding to implementation, working closely with users throughout. Working mainly with VAX machines under VMS, training will be given to new applicants with a minimum of two years' DEC COBOL + skills. REF: AW/2815.

MAJOR ICL DEVELOPMENTS CITY To £12,000 + Subs Mort.

This prestigious financial firm based in the City can offer exciting career moves for ICL 2960 VME professionals from programmer to team leader levels. Of particular interest are those candidates who are able to offer skills in either DMS and/or DMS. As a successful and progressive company they offer working conditions and excellent perks which include subsidised mortgage and excellent career path. REF: DW/2482.

HONEYWELL COBOL MIDDLESEX £8,500

12 months' + Level 64 or 66 COBOL is required by this progressive Middlesex-based company to join their development team. TDS experience would be an advantage although not essential as this company believe in offering their staff a range of training facilities. You will be involved with a number of commercial applications team accounts to stock control systems. The company also offer sports and social club facilities and a subsidised restaurant in their package. REF: DW/2673.

HEWLETT PACKARD ALL LEVELS To £14,000

Based in Herts, my client is seeking Analyst/Programmer with good HP 3000 COBOL experience at any level either junior or senior. The company is expanding and there are many new development projects underway. Prospects are excellent and management projects are envisaged for the right applicants. REF: AW/2816.

ANALYST/PROGRAMMER ESSEX £10,000

My Essex-based client is seeking Honeywell mainframe COBOL people at Analyst/Programmer level. Two years' relevant experience is required together with PL/I and/or PDS. The successful applicant will have the opportunity to work on simple programming projects through to high level analysis. Applications are mainly commercial and include accounting and order processing. A good career path and attractive salary is envisaged for the right person along with a benefits package including flexitime, four weeks' holiday, profit share, pension and medical insurance scheme. REF: DW/2779.

HEWLETT PACKARD ANY LANGUAGE To £10,500

Are you currently an HP 3000 Programmer with in excess of 18 months' experience in any language? If you are, my London-based client, a long established dynamic concern would like to hear about you. They are currently developing new systems for both the HP 4000 and HP 2000 series. COBOL, BASIC and some REX/PC. You will work in a small team using the latest on-line programming techniques. You can expect a progressive career and excellent salary. Call me now for further details. REF: AW/2817.

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Experience with the DEC/PDP ranges, HEWLETT-PACKARD and IBM machines or a variety of microprocessors would be useful in some instances, as would a knowledge of microelectronics.
Salaries and prospects are excellent. Relocation expenses will be paid where necessary.
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RPG II/III

IBM SYSTEM 34

An outstanding opportunity has arisen with a London-based company connected with the oil industry. They require an additional Analyst/Programmer with 18 months' IBM System 34/PL/I experience. You will be working in a team where you will be involved with the development of a Management Reporting System so if you want to put a highly motivated team of Q.P. professionals, where promotion prospects are unlimited, plus the opportunity to travel abroad at a later date then why not give me a call to arrange a confidential interview. Ref: GW/2572.

IBM SYSTEM 34/RETRAIN 38

A highly successful software consultancy based in the heart of the City are seeking to recruit an IBM System 34 RPG II Programmer. The company are currently in the process of the development of new financial systems, high on the IBM System 34 and 38 hardware full training on the IBM System 38 will be given. You will be ideally suited if you are an experienced RPG II Programmer with the desire to become involved with the latest on-line techniques. You will be well rewarded in terms of conditions and salary. Ref: GW/2030.

PROGRAMMER/ANALYST NORTH LONDON/HERTS BORDERS

This successful international group are planning to develop major new systems which has led to an opening for an additional Programmer/Analyst with an IBM System 38/PL/I background, although an experienced IBM System 34 Programmer would be strongly considered. The candidate chosen for this position will initially be programming, and at a later date move into analysis where you will be sent on full IBM course. Excellent benefits are offered and relocation assistance is available where necessary. Ref: GW/2731.

IBM SYSTEM 38

A superb position has arisen with a major City Bank for an IBM System 38 RPG II Programmer to take up a position within a small team developing financial and banking systems to a very high standard. The essential requirements are for a self-motivated D.P. professional, with at least 12 months' RPG II experience gained within a well-structured environment. A half banking package is offered including a subsidised mortgage. Ref: GW/2612.

IBM SYSTEM 34

An opportunity exists within a prestigious international bank for a capable and experienced Analyst/Programmer to move into a supervisory role. The successful candidate will lead a small team of 4 people currently involved in the development of major new on-line systems. 3 years' programming experience is essential with a minimum of 12 months' IBM System 34 RPG II. This is an important position and career prospects are excellent for the right person. Full banking package is offered including a subsidised mortgage. Ref: GW/3530.

For more details of these and other outstanding opportunities, contact Carol Gorman, our GSO specialist.

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As in any growth company more people are required to maintain existing workloads and to further strengthen the business for the future.

Software Support Analysts salary negotiable, company car and large company benefits

Software analysts are required to enlarge the team in Sutton, Surrey, who provide full software support services for both the U.K. and European Operations. Applicants should have 4-5 years experience in a scientific, industrial and related computer environment and be fully conversant with operating systems software, scientific high level languages and/or assemblers. You must have the ability to communicate your ideas to a wide range of computer users and have a high degree of articulation and a genuine enthusiasm for your work. In return Gould offer the experience of a unique blend of pre and post sales support, software development and applications consultancy.

Software Support Analysts salary negotiable, company car and large company benefits

Gould wish to recruit additional software analysts to be based in their head office at Sutton, to provide software support services for the U.K. and European Operations. Applicants for these positions should have a broad range of experience including in-depth knowledge of the UNIX operating system. They must also have the ability to communicate with a wide range of computer users, and have strong team leadership capability. The analysis appointed will be working in both pre and post sales support software development and applications consultancy.



Salaries are negotiable from around £9 - 15,000 p.a. In addition to generous financial remuneration packages the company also offer excellent career paths for talented people.

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Sloangate Recruitment Advertising Limited
Dominic House, 171-177 London Road, Kingston-upon-Thames,
Surrey KT2 6RA. Telephone 01-549 9236

Sloangate Recruitment Advertising

ANALYSTS & PROGRAMMERS

MVS TRAINING

CITY to £13,000 pa
Multi-national organisation based in the City is strengthening its technical side. This has necessitated the need to employ good DOS/VS SYSTEMS PROGRAMMERS. Current hardware consists of IBM 4341's, upgrading soon to IBM 3083's, which will utilise the MVS operating system, thus creating a perfect opportunity for successful candidates to migrate to MVS. This is a fast growing department offering excellent staff benefits. Ref: S1282.

CICS TRAINING

CITY to £10,000
A City-based International Bank housing 2 x IBM 4341's under DOS/VS(E), with CICS and DLI. It is currently recruiting a number of PROGRAMMERS, to join their MAJOR ON-LINE COMMERCIAL LOANS TEAM. Programmers with around 2 years' experience of COBOL and preferably some exposure to CICS and/or DLI, who would welcome further training in these areas should apply now. Company benefits and scope for career advancement are excellent. Ref: A1253.

ANALYST/PROGS

SW LONDON to £13,000 pa
This MANUFACTURING giant situated in South West London would like to recruit good IBM ANALYST/PROGRAMMERS, with at least 2 years programming in COBOL, and some ANALYST experience. They house IBM 4341 computers with CICS on-line and DLI Database. The successful candidates will have the opportunity to become increasingly involved in SYSTEMS ANALYSIS, DESIGN and OPERATIONS, and those with the potential will progress into management. Ref: S1311.

PL1 PROGRAMMERS

CITY £8-12,000
One of the largest and most successful international insurance Broking Groups based in the City are recruiting a number of PL1 programmers. Interesting on-line applications await you in a sophisticated environment consisting of an IBM 4341, Series 1 Micros and recently installed WANG VS equipment. Candidates with a good standard of education and between 2-5 years experience of PL1 programming, should apply now for an early interview. Ref: A1310.

CICS PROGRAMMERS

SURREY £10,000 + pa
Large international travel organisation have positions available for programmers with at least 2 years programming in COBOL on IBM hardware using CICS. Their computer is an IBM 4331, with a large on-line network of terminals, both remote and local. Wide range of interesting development work available covering various systems. Excellent salary and benefits on offer, generous WORLD-WIDE TRAVEL CONCESSIONS, free Life Assurance and subsidised staff restaurant. Ref: S1244.

SYSTEMS ANALYST

CITY to £13,500
This major organisation is looking for ANALYSTS to join their expanding project team concerned with developing ON-LINE ACCOUNTING SYSTEMS. Our client houses an IBM 3033 running under MVS, IMS DB/DC with communications links to a PRIME MINL. The successful applicants will have around four years' total experience, preferably gained in an IBM mainframe environment and ideally have had some exposure to minis. Opportunities for career progression are excellent. Ref: A1271.

Those are just some of the positions available. If your particular "expertise" or "ideal job" has not been advertised, then give SBS a call and discuss your career requirement with one of our recruitment team.

SBS RECRUITMENT

Scientific & Business Systems Limited
22 Bloomsbury Square London WC1A 2NS
Telephone 01-637 5541 (24 hr answering service)

TANDEM/VAX TRAINING

LONDON/H. COUNTIES to £14,000
Several prestigious companies in both Central London and the adjoining counties need experienced COBOL Analyst/Programmers. Where necessary people will be re-trained on VAX or TANDEM equipment. Salaries vary according to experience. In some cases benefits will include a CAR. These clients include manufacturers, software houses and end-users. Applicants must have commercial D.P. experience, but ANY hardware background will be considered. Ref: F1085.

ANALYST/PROGS

CITY c. £12,500
This well known INTERNATIONAL BANK located in the city are currently recruiting BASIC Analyst/Progs. Candidates should have a minimum of 2 years programming experience, and preference will be given to people with a knowledge of PDP hardware. Benefits include subsidised mortgage, season ticket loan, pension etc. TRAINING on VAX will be given. Opportunities are also available for Senior A/P's to move into project management. Ref: F1135

PROGRAMMERS

BERKS/SURREY c. £12,000
Companies in the above areas have engaged our services to recruit experienced DEC programmers. Candidates should have commercial experience in FORTRAN, MACRO or BASIC+. This is an ideal opportunity for those with experience of real-time systems to advance their careers. EUROPEAN travel will be necessary in some cases. Ideal candidates should have knowledge of RSX11 or RT11 but training will be provided. Ref: F1247.

CICS TRAINING

CITY £8,500-£11,000 pa
Our client is a prestigious city-based FINANCIAL institution embarking upon a major expansion programme. They now need to recruit 2 to 3 IBM COBOL PROGRAMMERS, with 12 months to 3 years experience. This company's configuration consists of 2 IBM 4341 Mainframes, utilising DOS/VS operating system. Knowledge of CICS on-line programming would be useful, but training will be provided where necessary. Excellent staff benefits are on offer. Ref: S1033.

SNR ANALYST/PROGS

LONDON to £15,000
A prestigious company located in London, wish to engage a Senior Analyst/Programmer. Applicants must be ready to move rapidly to the post of Project Manager. Candidates should be able to show a background of programming and design. A knowledge of financial/accounting or order processing systems is desirable but not essential. Top salaries are available and benefits packages are negotiable. MIN/MICRO experience highly advantageous. Ref: F1116.

SNR ANALYST/PROGS

ESSEX to £13,500
Our Client, one of Britain's largest Investment Services Organisations are currently recruiting a Senior Analyst/Programmer to become involved in the development of a new insurance and Pension Scheme. The current configuration is two IBM 4341's under DOS/VS(E) with COBOL, CICS and VSAM. Experienced Analyst/Programmers, preferably with some exposure to CICS, who would welcome the opportunity to further their careers in a progressive environment, should call now. Ref: A1312.

CONTRACTS

IBM SYSTEM 34 RPG II ± COBOL
ANALYST PROGS

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DEC DIBOL CTS 500 ANAL/PROG

KENT

IBM COBOL IMS DB/DC ANAL PROG

SURREY

IBM SYSTEM 38 RPG III ± MAAPICS
ANAL/PROG

SUSSEX

For further details contact NIK POE AND TLP

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- **PRE-SALES SUPPORT SYSTEMS ANALYST**
Based in Nottingham DEC experience preferred. Ref: R.V. Gutteridge.
- **SENIOR FIELD SERVICE ENGINEER**
Based in Winchester. DEC experience preferred. Ref: R.C. Gould
- **FIELD SERVICE ENGINEERS**
London, Winchester and Nottingham areas. DEC experience preferred. Ref: R.C. Gould

These positions represent worthwhile opportunities in a go-ahead company with excellent working conditions. A first class remuneration package is offered including BUPA Life Assurance and usual fringe benefits.

Write with full career details to date.
CSP Barrasford House, Goldsmith Street, Nottingham, NG1 5JY.
Tel: (0602) 415155.

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Midlands/North West c. £13K + Relocation

This is an excellent opportunity to join a major progressive organisation currently expanding its computer network. The successful candidate will join a small dynamic technical support team and will specialise in DIPS 6 support, although there will be ample opportunity to work with a variety of other hardware/software.

Sound GCOS 6 experience is essential, ideally on a networked environment using T.P.S. In addition to good technical skills, candidates should have a broad appreciation of user needs in a complex environment.

Rewards include:

- High degree of job satisfaction
- Progressive salary based on merit
- Excellent career prospects
- First class conditions of employment
- Relocation package where appropriate

All replies will be treated in strict confidence.

For further details, please contact Barry Turin on (0270) 627206 weekdays, or Alsager 1093631 4743 during evenings and weekends, or write to him at the address below.



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IBM SYS/38

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We are an insurance company with a difference. As a young and dynamic group, we are market leaders in providing a specialist service to students, graduates and young professionals. Since conception we have been at the forefront of developing a range of innovative business systems and insurance products.

With our current expansion and development plans we now need to expand our computer services team. The ideal candidates will be self motivated and must be able to follow projects through from feasibility to implementation. In addition to normal applications you will be totally involved in our full range of diverse and sophisticated business systems. The nature of the department means you will have every opportunity to increase your technical and analysis experience.

In addition to a negotiable salary benefits include, free pension and life assurance schemes, 25 days holiday and a generous relocation package to move to the Cotswold area.

For further information please call our advising consultant Richard Milsum on 01-354 1055 during office hours or on 01-958 2553 in the evenings or weekends. Alternatively please send full details to him at:

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Ericsson Information Systems is the U.K. subsidiary of the world leading telecommunications manufacturer. Their goal is integrated information systems and office automation for which they already have all the essential components.

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Advanced ergonomically designed terminals
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To ensure the Company's continued development at their current growth rate of 30% per annum, the following additional software appointments are now to be made:

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SALARY PACKAGE - £11K to £14K + Car or Car Allowance

The successful candidates will have a positive approach to both pre and post sales, together with at least 5 years computing experience. You will need to demonstrate experience of:

- Commercial/Business Systems
- Systems Analysis
- Mini Computers
- Project Management
- Telecommunications
- Sales Support

Systems Advisers

BIRMINGHAM AND LONDON

SALARY PACKAGE - £9K to £11K + Car Allowance

To be offered these positions, you will need to have up to 5 years computing experience and will be able to demonstrate a working knowledge of the following:

- Commercial/Business Systems
- Systems Analysis
- Mini Computers
- COBOL programming experience

Senior Programmer/Analysts

BIRMINGHAM AND LONDON

SALARY PACKAGE - £9K to £11K + Car Allowance

These roles will assume the principal technical responsibility within the Group. The following expertise is required:

- A minimum of 2 years COBOL on mini computers
- Real time commercial applications experience
- Experience of structured programming
- Telecommunications

Applications Programmers

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SALARY PACKAGE - £7K to £9K + Car Allowance

The appointed candidates will work as part of the Customer Services Team with a high level of user contact in tailoring standard application packages and the provision of technical support. The required experience is:

- 12 months COBOL on mini computers
- Real time commercial applications experience
- Structured programming

BUT ALL THIS IS NOT ENOUGH - WE NEED A DIALOGUE WITH YOU ON THE SHAPING OF THE SYSTEMS OF THE FUTURE. ERICSSON'S ARE READY WHEN YOU ARE AND THEY ARE WELL AHEAD OF THE FIELD.

For further information and a local interview in either Birmingham or London, please telephone the Advising Consultants on 061-236-1157 during office hours. Evenings and Weekends until 9.00 p.m. telephone Jeff Walton on 061-962-0002 or Roy Torres on 0422-823153.

INTERFACE

RECRUITMENT & SELECTION CONSULTANTS LTD

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Capable of investigating methods of Network Management and Control; designing and developing a tool that will enable your team to deliver software for a new concept of Network Management.

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The project . . .

Is based in The West on client premises, though later some development may be brought in-house (also in West).

The positions . . .

are for both:
TEAM LEADERS AND TEAM MEMBERS

The company . . .

Offer an ideal opportunity for enthusiastic and well qualified professionals to enhance both their own and the company's reputation at home and abroad.

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NORTH WEST

IBM COBOL CICS DL/1 ANALYST/PROGRAMMERS

SOFTWARE AND CONSULTANCY SERVICES

As part of our planned expansion in 1983/84 an outstanding opportunity exists for Analyst/Programmers with good COBOL CICS and DL/1 experience to join our North-West Regional Systems Team.

P-E Computer Services is a leading international software house and consultancy. Since 1959 we have provided a comprehensive service in the areas of consultancy, training services, systems development and support.

Company benefits include an attractive salary, company car, generous expense allowances, non-contributory pension scheme plus the security of working for a long-established, well-managed professional organisation.

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Systems Analysts £25,000 Tax Free

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Supervisors - TP Services/ TP Equipment Analysts £25,000 Tax Free

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DATA PROCESSING COMPUTING CONTROL ASSISTANT

(Scale 6/802) £8,154-10,639

COMPUTER CENTRE - SWINTON

Post Ref: 3019/CW

The Computing Control Section assists the Computer Operations Manager by the design and application of computer operations procedures, including, now and revised applications running on the City Council's equipment, which the principal machine is, at present, an ICL 2966 running under VMS, which the principal machine is, at present, an ICL 2966 running under VMS. Major development of new applications, based on ICL 2966 and TP & MVS. Existing work embraces ICL 2966 batch and 2900 batch, TP & MVS. The responsibilities include data security, scheduling work, recording and monitoring machine use, mail selection and the provision of a full range of computing service to City Council departments from an efficient and reliable computer, operating software and computer-based equipment. The successful applicant will possess practical experience and knowledge of the operational aspects of the provision of a computing service. Starting salary will depend on qualifications and experience. Application forms may be obtained from the Personnel Manager, City Centre, Salford, Manchester M2 2BN. Telephone 061-561 2111. Please quote the appropriate post reference in all communications. Only data for applications: October 7, 1983.

MANNS

A regional operating company of Watney Mann and Truett Breweries Limited require a

DATA PROCESSING OPERATIONS MANAGER

to be based in Northampton

Responsibilities will include the efficient and economical management of the department along with the provision of a comprehensive data processing service to the company using three Data General mini computers with communications links to an IBM mainframe computer. If you have experience in this field, are educated to a high level and are aged between 25 and 45 then we would like to hear from you.

The salary and benefits are as you would associate with a major company and applications should be made to: Mr C. Pollard, Manns Northampton Brewery Company Limited, PO Box 22, Lodge Way, Harlestone Road, Northampton NN5 7UU, stating relevant experience and current salary.

Join our action force

We're Palitoy, the UK's leading toy manufacturers, makers of such famous names as Star Wars, Action Man - and Action Force, of course. Our own Action Force of dedicated DP professionals is expanding to cope with a major development programme on interactive systems based on IBM 38 - and we're currently looking for additional troops (male or female) to join us.

Operations Manager

We now require an Operations Manager, with proven managerial ability to lead a team of 12. Educated to 'A' level standard preferably with a working knowledge of IBM System 34/38.

O and M Analyst

To analyse and appraise our existing systems to ensure that users are adequately trained and that procedures are followed. In addition, the person appointed will assist in the design of new interactive systems and be responsible for ensuring all documentation is accurately maintained during this period of intensive systems development. A background in DP work and considerable O and M experience as applied to computer systems is essential.

Analyst/ Programmer RPG II/III

To develop interactive systems on our IBM System 38. We require a minimum of 6 months' GSD experience, combined with analyst/programming experience, using RPG II/III. In addition, a knowledge of COBOL and BASIC would be an advantage. Good communicative skills are essential to liaise between user and development staff. As a successful and progressive company we can offer competitive salaries together with attractive employment conditions and relocation where appropriate. Interested? Think you can handle the challenge? Then write or telephone for an application form to:

The Personnel Department, Palitoy Company, Owen Street, Coalville, Leicestershire. Tel: Coalville 36388.

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£12-16,000 p.a.

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For further details of this exciting opportunity, please telephone Ken Allwright on (0628) 74274 or write to him at Charvil Lewis International, 27 Marlow Road, Maidenhead, Berkshire.

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We have been retained by a computer company which is part of a large transport group.

This company is developing a fully integrated computer package which services haulage companies throughout the United Kingdom. It has been developed on micros and there are now plans to convert this system on to minis.

This is an excellent opportunity to join this young company and develop with it as it grows. It is anticipated that a move into management will follow shortly.

The skills required are strong micro knowledge from both the technical and user aspects (Sirus, Apple etc.), knowledge of transport operations particularly desirable but not essential. Working with minimal supervision, you will need to be a self starter, possessing the skills to get things done quickly and efficiently. Technical support will be an important part of the position which could involve UK travel from time to time. A flexible attitude to work is essential.

For additional details please phone Sue Ashby on 0784 59247 or at home on 0844 53531 (evenings & weekends).

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